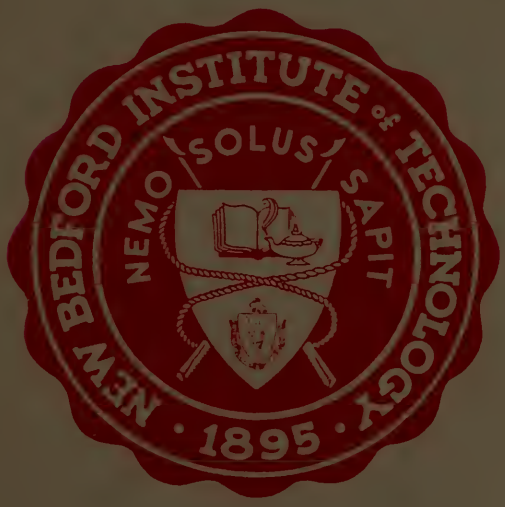
NEW BEDFORD INSTITUTE

OF

TECHNOLOGY

Founded In 1895



BULLETIN 1963-1965

SMU
ARCHIVES

For all information pertaining to college admission, address:

THE DIRECTOR OF ADMISSIONS
NEW BEDFORD INSTITUTE OF TECHNOLOGY
TECHNOLOGY CENTER—NEW BEDFORD, MASSACHUSETTS

Visitors to the school are welcome, and guides are available. The Administration Offices are open Monday through Friday from 8:00 A.M. to 4:30 P.M.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Technology Center

New Bedford, Mass.

Member of

NEW ENGLAND ASSOCIATION OF COLLEGES

and Secondary Schools

COEDUCATIONAL

BULLETIN FOR THE ACADEMIC YEARS

1963-1965

FOREWORD

The purpose of this issue of the Bulletin is to provide information for prospective students, or anyone else who may be interested in the history, traditions, objectives, resources, programs, equipment and staff of the Institute.

New Bedford Institute of Technology

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NEW BEDFORD INSTITUTE OF TECHNOLOGY

Calendar of Events

ACADEMIC YEAR
1963-1964

Year 1963

SEPTEMBER

4—Wednesday, 9:00 A.M.	Freshman Registration
5—Thursday, 9:00 A.M.	Upper Class Registration
6—Friday, 9:00 A.M.	Freshman Orientation
9—Monday, 8:00 A.M.	Freshman Testing
10—Tuesday, 8:00 A.M.	First Semester Begins
23-27—Monday through Friday	Freshman Class Elections

NOVEMBER

1—Friday	Mid-Semester Marking Period
11—Monday	Veterans Day
27—Wednesday, 11:50 A.M.	Thanksgiving Recess Begins

DECEMBER

2—Monday, 8:00 A.M.	Thanksgiving Recess Ends
18—Wednesday, 3:50 P.M.	Christmas Recess Begins

Year 1964

JANUARY

2—Thursday, 8:00 A.M.	Christmas Recess Ends
13—Monday, 9:00 A.M.	Mid-Year Exams Begin
22, 23—Wednesday, Thursday, 9:00 A.M.	Registration-Second Semester
24—Friday	Mid-Year Exams End
27—Monday, 8:00 A.M.	Second Semester Begins

MARCH

20—Friday	Mid-Semester Marking Period
20—Friday, 3:50 P.M.	Spring Recess Begins
30—Monday, 8:00 A.M.	Spring Recess Ends

APRIL

20—Monday	Patriot's Day, Holiday

MAY

18—Monday, 9:00 A.M.	Final Exams Begin
29—Friday	Final Exams End
29—Friday	Baccalaureate
31—Sunday	Commencement and President's Reception

Calendar of Events

ACADEMIC YEAR
1964-1965

Year 1964

SEPTEMBER

9—Wednesday, 9:00 A.M.	Freshman Registration
10—Thursday, 9:00 A.M.	Upper Class Registration
11—Friday, 9:00 A.M.	Freshman Orientation
14—Monday, 8:00 A.M.	Freshman Testing
15—Tuesday, 8:00 A.M.	First Semester Begins
21-25—Monday through Friday	Freshman Class Elections

OCTOBER

12—Monday	Columbus Day—Holiday

NOVEMBER

6—Friday	Mid-Semester Marking Period
11—Wednesday	Veterans Day—Holiday
25—Wednesday, 11:50 A.M.	Thanksgiving Recess Begins
30—Monday, 8:00 A.M.	Thanksgiving Recess Ends

DECEMBER

18—Friday, 3:50 P.M.	Christmas Recess Begins

Year 1965

JANUARY

4—Monday, 8:00 A.M.	Christmas Recess Ends
18—Monday, 9:00 A.M.	Mid-Year Exams Begin
27, 28—Wednesday, Thursday	Registration-Second Semester
29—Friday, 4:00 P. M.	Mid-Year Exams End

FEBRUARY

1—Monday, 8:00 A.M.	Second Semester Begins
22—Monday	Washington's Birthday—Holiday

MARCH

26—Friday, 3:50 P.M.	Mid-Semester Marking Period
26—Friday, 3:50 P.M.	Spring Recess Begins

APRIL

5—Monday, 8:00 A.M.	Spring Recess Ends
16—Friday	Good Friday
19—Monday	Patriot's Day—Holiday

MAY

3-7—Monday through Friday	Upper Class Elections
24—Monday, 9:00 A.M.	Final Exams Begin
31—Monday	Memorial Day—Holiday

JUNE

4—Friday, 3:50 P.M.	Final Exams End
5—Saturday	Baccalaureate
6—Sunday	Commencement and President's Reception

NEW BEDFORD
INSTITUTE OF TECHNOLOGY

Directory of Personnel

BOARD OF TRUSTEES 1963

Dr. Owen B. Kiernan, *Commissioner of Education*
Edward F. Harrington, *Mayor,* Municipal Bldg.
Dr. James R. Hayden, *Superintendent of Schools*, 166 William Street

Term Expires 1963

Francis P. Delaney, 143 Pleasant St., Fairhaven, Mass., Supervisor in Education, Mass. Rehabilitation Commission, 628 Pleasant St., New Bedford, Mass.

George E. Carignan, 386 Union St., New Bedford, Mass., Director Financial Secretary, New Bedford Joint Board Textile Workers Union of America, 384 Acushnet Ave., New Bedford, Mass.

Dr. John B. O'Toole, Jr., 89 Mt. Pleasant Street, New Bedford, Mass.

Mrs. Lydia B. Nunes, Attorney, 97 Hillman St., New Bedford, Mass.

Joseph M. Souza, 25 Junior St., New Bedford, Mass., Third District Court

Term Expires 1964

Nils V. Nelson, 8 Temple Ave., Winthrop, Mass., N. V. Nelson Co., Cotton, 72 Woodside Ave., Winthrop, Mass.

Milton Gollis, 567 Rockdale Ave., New Bedford, Mass., Proprietor, Gollis Women's & Men's Apparel, 562 Pleasant St., New Bedford, Mass.

Walter Smietana, 84 Ellen St., New Bedford, Mass., Teacher, Somerset High School, Somerset, Mass.

Joseph Dawson, Jr., 15 Elm St., So. Dartmouth, Mass., President and Treasurer, Knowles Loom Reed Works, Inc., 114 Myrtle St., New Bedford, Mass., Treasurer of Whaling City Marine Inc., P.O. Box 589, New Bedford, Mass.

John E. Vertente, Jr., 67 Mechanics Lane, New Bedford, Mass., International Representative, United Textile Workers of America, 746 Pleasant St., New Bedford, Mass.

Term Expires 1965

Alfred J. Gomes, 450 Cottage St., New Bedford, Mass., Attorney, 758 Purchase St., New Bedford, Mass.

Serafin E. Mello, 335 Rockdale Ave., New Bedford, Mass., Broker, 375 Dartmouth St., New Bedford, Mass.

James F. Francis, 27 Rodney St., New Bedford, Mass., Principal, Rogers School, 73 Center St., Fairhaven, Mass.

Waldo E. Haydon, 43 Hedge St., Fairhaven, Mass., Life Insurance Agent, John Hancock Ins. Co., 888 Purchase St., New Bedford, Mass.

Beatrice P. Thomas, 63 Summer St., Fairhaven, Mass.

ADMINISTRATION

John E. Foster, B.S.C.E., Sc.D
President

James L. Giblin, M.S.
Dean of Faculty

Augustus Silva, A.B., M.A.
Dean of Students

George Walker
President Emeritus

ADMINISTRATIVE ASSIGNMENTS

Edith Booth
Director of the Bookstore

Edward A. Cormier, B.S. in B.A., Ed.M.
Director of the Summer School

James A. Flanagan, B.S. in Ed.
Director of Public Relations
Director of Placement

Warren M. Holt, B.S., Ed.M.
Director of Admissions

Mary F. Makin
Treasurer

Dwight F. Mowery, Jr., A.B., Ph.D.
Director of the Graduate School

Louis Pacheco, Jr., B.S.T.E., Ed.M.
Director of the Evening School

Claire N. Riley, A.B.
Director of the Library

J. Louis Roberts, B.S.M.E., P.E.
Superintendent of the Buildings

Fred R. Tripp, B.S., Ch.E.
Director of the Research Foundation

The Advisory Committee to the Administration is composed of all Department Chairmen.

FACULTY

Milton S. Briggs, B.B.A.
Professor of Business Administration
Chairman of the Department

James L. Giblin, M.S.
Commonwealth Professor of Textile Engineering
Chairman of the Department

Lenine M. Gonsalves, B.S., M.S.E.E., P.E.
Professor of Electrical Engineering
Chairman of the Department

ANTHONY J. JOHN, B.S., M.A.
Professor of Mathematics
Chairman of the Department

DWIGHT F. MOWERY, JR., A.B., PH.D.
Professor of Chemistry

AUGUSTUS SILVA, A.B., M.A.
Professor of English
Chairman of the Department

LEO M. SULLIVAN, B.S. in ED., M.A.
Professor of Social Sciences
Chairman of the Department

HOWARD C. TINKHAM, B.S.M.E., M.S.M.E.
Professor of Mechanical Engineering
Chairman of the Department

FRANCIS TRIPP, B.S.CH.E., B.S.T.C., M.S.CH., CH.E.
Professor of Chemistry
Chairman of the Department

ADAM BAYREUTHER
Associate Professor Emeritus of Mechanical Engineering

FRED BEARDSWORTH
Associate Professor Emeritus of Textile Engineering

JOHN C. BROADMEADOW, B.S.CH.E., B.S.T.C., ED.M.
Associate Professor of Chemistry

PETER O. CIOFFI, B.S., M.S.
Associate Professor of Mathematics

EDWARD H. CLOUTIER
Associate Professor of Textile Engineering

EARL J. DIAS, A.B., M.A.
Associate Professor of English

EDMUND J. DUPRE, B.S.T.C., ED.M.
Associate Professor of Chemistry

LOUIS E. F. FENAUX, B.S.CH., M.S.CH.
Associate Professor of Chemistry

FRANK HOLDEN
Associate Professor Emeritus of Textile Engineering

WARREN M. HOLT, B.S., ED.M.
Associate Professor of Mathematics

FREDERIC R. MATTFIELD, B.S. in B.A., M.B.A., ED.M.
Associate Professor of Business Administration

LOUIS PACHECO, JR., B.S.T.E., ED.M.
Associate Professor of Textile Engineering

JOHN R. BARYLSKI, B.S.M.E., ED.M.
Assistant Professor of Mechanical Engineering

CLIFFORD N. BECK, B.S.T.E.
Assistant Professor of Textile Engineering

Alden W. Counsell, B.S.M.E.
Assistant Professor of Mechanical Engineering

Michael Crowley, B.S., M.A.
Assistant Professor of Mathematics

Ferdinand P. Fiocchi, B.S.
Assistant Professor of Chemistry

Fryderyk E. Gorczyca, B.S.M.E., M.S. (N.E.)
Assistant Professor of Mechanical Engineering

Celestino D. Macedo, A.B., A.M.
Assistant Professor of English

Walter E. A. Mierzejewski, A.B.
Assistant Professor of Mathematics

Margot Neugebauer, B.F.A., M.F.A.
Assistant Professor of Design and Fashion

John T. Regan, A.B.
Assistant Professor of Textile Engineering

Conrad P. Richard, B.S.M.D., P.E.
Assistant Professor of Mechanical Engineering

J. Louis Roberts, B.S.M.E., P.E.
Assistant Professor of Mechanical Engineering

Antone Rodil
Assistant Professor of Textile Engineering

William A. Silveira, B.S.T.E., M.S.T.T.
Assistant Professor of Textile Engineering

Arthur V. Swaye, B.S.T.E.
Assistant Professor of Textile Engineering

Henry Swift, A.B., M.B.A.
Assistant Professor Emeritus of Business Administration

George J. Thomas, B.S.C.E., P.E.
Assistant Professor of Physics

Fred R. Tripp, B.S.Ch.E., B.S.T.C.
Assistant Professor of Chemistry

Richard Walder. B.S.E.E.
Assistant Professor of Electrical Engineering

Robert C. Booth
Instructor in Design and Fashion

Lance C. Buhl, A.B., M.A.
Instructor in Social Sciences

Martin J. Butler, BA., M.A.
Instructor in Social Sciences

Edward A. Cormier, B.S. in B.A., Ed.M.
Instructor in Business Administration

James A. Flanagan, B.S. in Ed.
Instructor in Chemistry

FRANK GOLEN, JR., B.S. in B.A., ED.M., C.A.G.S.
Instructor in Business Administration

DANIEL J. MURPHY, B.S.E.E.
Instructor in Electrical Engineering

EVELYN RAMALHETE, B.S.T.D.F.
Instructor in Design and Fashion

LOUIS J. ROBITAILLE, B.S. in B.A., ED.M.
Instructor in Social Sciences

PRISCILLA R. TABACHINK, B.S. in B.A.
Instructor in Business Administration

ROSEMARY S. TIERNEY, A.B., ED.M.
Instructor in English

JOHN F. WAREING,
Instructor in Electrical Engineering

VIVIAN ZERBONE, A.B., M.A.
Instructor in Modern Languages

GEORGE JACOBS, A.B., LL.B.
Visiting Lecturer in Business Law

HANS E. PICARD, B.S.E.E.
Visiting Lecturer in Electrical Engineering

GEORGE CHENG, B.A., M.S.E.E.
Visiting Lecturer in Electrical Engineering

JUNE F. DEVINE, B.F.A.
Visiting Lecturer in Music

FREDERIC ALPERT, A.B., M.B.A.
Visiting Lecturer in Business Administration

NEW BEDFORD INSTITUTE OF TECHNOLOGY

General Information

THE COLLEGE

Objectives

As an *educational* institution, the New Bedford Institute of Technology is dedicated to the task of stimulating intellectual growth. It seeks not only to provide each student with a solid foundation for professional training, but also to cultivate in him a lifelong intellectual curiosity and a yearning for truth. It also seeks to instill a desire for self-improvement, not only professional but cultural as well, in order that each graduate may take his place among educated men and women in every walk of life. Attainment of this objective is facilitated through the creation of an atmosphere conducive to learning provided by a capable and inspiring faculty and an enlightened and progressive administration.

As an institution of *higher learning,* the Institute is charged with the responsibility for the advancement of learning through research and also for the preservation and interpretation of accumulated knowledge. Upon the proper discharge of this responsibility depends the welfare not only of the nation but of the world. Its importance is so great that no institution possessing the capability can afford to neglect it. In addition, this activity on the part of the faculty members keeps them intellectually curious, alert, and resourceful and enables them to offer the student the maximum in exemplification and inspiration.

As a *technological institution,* this Institute devotes its major activity to technical subjects. In a broad sense these may be defined as mathematics, the pure sciences, the applied sciences, the business sciences and those practical arts utilizing scientific or systematic procedures.

History

Founded in 1895, the New Bedford Institute of Technology has been, from its very beginning, one of the most modern and best-equipped schools of its type in the world.

At the first meeting of the Board of Trustees on January 27, 1896, committees were appointed to supervise the building and financing of the school, the establishment of a curriculum, and the installation of machinery and other equipment. In 1897, the city of New Bedford appropriated $25,000 for the use of the school, and the Commonwealth of Massachusetts appropriated a similar amount in the following year. With these funds, the first of the present buildings was constructed. The Institute is now one of the Massachusetts state colleges.

Since its founding, the Institute has moved with the times. During its first year, it was concerned primarily with training students to play important roles in the textile industry. Instruction was emphasized in both the theory and practice of all phases of manufacturing, finishing, and distribution of textiles.

In recent years, however, in adjusting to the demands of the economic climate, the Institute has, in addition to its internationally-known curriculum in textiles, introduced first-rate programs in other forms of technology. Such educational fields as mechanical engineering, electrical engineering, chemistry, textile chemistry, textile design and fashion, and business administration have become part of an ever-expanding curriculum.

Furthermore, a new emphasis has been placed on purely cultural courses in the arts and social sciences, since any engineer, technologist, or student of business administration will be a better-rounded individual if he has an acquaintance with what Matthew Arnold has called "the best that has been thought and said."

Part of the educational policy of the Institute is its strong belief that any college graduate be afforded the opportunity to gain knowledge and appreciation of the ideas, the movements, the creative contributions that are the basis of the heritage of Western civilization.

The New Bedford Institute of Technology is justifiably proud of its professional standing and the recognition it receives throughout the world. This recognition is evidenced by the many representatives of foreign countries who have matriculated at the Institute. This representation has, over the years, included students from Canada, Mexico, Brazil, Chile, Ecuador, Bolivia, Salvador, the Philippines, Korea, Pakistan, India, Formosa, Haiti, France, Portugal, Greece, Turkey, and Iraq.

Environment

Situated in New Bedford, Massachusetts, a city with a population of more than 100,000, the Institute boasts an exceptionally good location for a technical college. The Institute is located on the main bus line of the city; in addition, it is only a brief ride from the city's modern and busy Municipal Airport.

New Bedford was, for many years, recognized as the greatest whaling city in the world. In fact, it was from New Bedford in 1841 that Herman Melville, the author of "Moby Dick," sailed for his historic voyage on the bark, Acushnet. Later in its history, with the expansion of the Industrial Revolution, New Bedford became the world's most important manufacturer of fine cotton yarns and fabrics.

Today, the city is a center for many diversified industries. These include the manufacturing and processing of rubber products, electronic equipment, aircraft, machine tools, screws and facets, and food production, in addition to textiles. Besides this, the city is the world's leading scallop port and is also in the first rank as a fishing port.

The fishing industry is a multi-million dollar enterprise, with the large fishing fleet supplying the city's many fish-processing houses and other consumers throughout the nation. In recent years, the port of New Bedford has also been used increasingly by merchant ships.

Of interest, too, is New Bedford's new and attractively constructed Industrial Park, located on the outskirts of the city and already attracting a number of new industries to the community.

These industries, both old and new, afford students at the Institute many opportunities for planned inspection trips, a valuable aid in acquainting the student with the practical phases of his academic work. In addition, the presence in the community of so many industries provides the student with numerous opportunities for part-time and summer employment.

Nor are New Bedford's advantages solely industrial. The city itself has all the picturesque charm of an old New England port—colorful harbor, sandy beaches, fine examples of Federalist architecture—plus the modern atmosphere of a progressive industrial city.

In addition, the city has always maintained a busy and rewarding cultural life. Only a few minutes walk from the Institute is the civic center, with its handsome buildings (including the excellent public library) attractive shopping areas, theatre district, and the world-famous Whaling Museum. And for those interested in the arts, New Bedford offers active amateur theatre groups, several first-rate concert and lecture series, the New Bedford Symphony Orchestra, art exhibits, and the like.

In summary, this old New England city, offering the best of the traditional and the new, is a pleasant place in which to live and to study.

Status

The New Bedford Institute of Technology is accredited by the New England Association of Colleges and Secondary Schools and is approved by the Collegiate Board of Authority of the Commonwealth of Massachusetts. This authority grants a Bachelor of Science degree to graduates who have successfully completed the prescribed courses. The Collegiate Board of Authority has also granted the Institute permission to confer the Master of Science degree in Textile Technology and Textile Chemistry.

The honorary Doctoral and Master of Science degrees are awarded to those whose outstanding achievements have made them leaders in their chosen fields of endeavor.

The Institute also plays a prominent role in the National Council of Textile Education. In addition, student chapters at the Institute are sponsored by the American Institute of Electrical Engineers, the Institute of Radio Engineers, the American Association of Mechanical Engineers, the American Chemical Society, the American Association of Textile Chemists and Colorists, the American Association of Textile Technologists, and the National Office Management Association.

The Institute is approved for the education of veterans under P. L. 550, 87th Congress, and P. L. 894, 81st Congress.

The Institute is approved by the offices of the Attorney General for the admission of alien students.

Buildings and Equipment

Art and Library Building — This was the first building erected on the present campus by the Commonwealth of Massachusetts. Completed in 1898, the three-story building now houses all art studios, the microscopy and photo-microscopy laboratories, the warp preparation laboratory, the Bookstore, a student office for the college newspaper, "Tech Talk," and a student lounge.

Each of the art studios is equipped with drawing tables, stools, easels, and reference material to provide the training facilities needed for the successful study of design, drawing, and painting.

The microscopy and photo-microscopy laboratories are used in conjunction with courses relating to the quantitative and qualitative study of the composition of textile and other related materials. These laboratories also are equipped with a wide range of microscopes, cameras, and supplementary instruments used in obtaining experimental data.

Winding, warping, and slashing equipment for both the cotton and synthetic systems are available for student use and demonstration in the warp preparation laboratory.

Textile Engineering Building — Erected in 1902 by the Commonwealth of Massachusetts as an addition to the Art and Library Building, this structure was enlarged in 1905 to provide an additional 20,000 square feet of floor space for textile manufacturing equipment.

The complete line of manufacturing equipment enables the student to learn the mechanics and capabilities of the individual machines in processing any fibers, whether natural or man-made, into yarn and woven or knitted fabrics of various types.

A testing laboratory provides instruction in the determination of all fiber, yarn, and fabric appearance and strength characteristics.

Chemistry and Engineering Building — Completed in 1911, this separate structure houses the following laboratories: chemistry, tool manufacturing, engineering drawing and machine tool, electronics, and dyeing and finishing. Modern lecture rooms, a pilot plant for chemical research, and the library also are located in this building.

All chemical, engineering, and electronic laboratories provide the student with the necessary equipment to perform practical experiments or projects in order to correlate class theory with practical and experimental proof. The dyeing and finishing laboratory allows the student to learn full-scale commercial dyeing and finishing of natural and man-made yarns and piece goods.

Engineering and Science Building — The most recent building on the campus was completed in the spring of 1956. The structure supplements

the facilities of the college with modern engineering, science, and research laboratories and well-designed classrooms. The laboratories include those devoted to mechanical engineering, electrical engineering, physics, physical chemistry, and microbiology. In addition, the building houses all administrative offices, an amphitheater, and a modern gymnasium.

Each of the laboratories is notable for its modern equipment, comparable to that of any other college of comparable size in New England.

ADMISSION PROCEDURES

Matriculation in any of the undergraduate curricula offered by the Institute is governed by the following procedures and requirements. (Admission requirements and procedures for graduate study are listed under the Graduate School section of this bulletin page 51.)

Each applicant must:

Obtain an application blank which contains Form A and Form B.

Submit Form A with application fee to the Institute.

Submit Form B to High School Guidance Director.

Make application to take the Scholastic Aptitude Test of the College Entrance Examination Board—the applicant is responsible for having the test scores sent to the Institute.*

General Requirements

The entrance requirements are intended to assist in selecting from among the many candidates for admission, those best qualified to take advantage of the educational opportunities at the Institute.

The general requirements pertaining to all curricula are:

The satisfactory completion often accredited high school curriculum or its equivalent, yielding 16 units of secondary school work. A unit is the equivalent of at least four recitations a week for a school year.

The primary basis for admissions is the student's standing in his high school graduation class. All applicants are required to take the Scholastic Aptitude Test of the College Entrance Examination Board preferably no later than March of their senior year.

Requirements for the Bachelor of Science degree

Business Administration:

Required subjects — 8 units

English	4 units	
Mathematics	2 units	(one of which must be algebra)
U. S. History	1 unit	
Science	1 unit	

*Refer to Page 17 for further information on the Scholastic Aptitude Test.

An applicant may meet these requirements if he has been graduated from a high school curriculum other than the College Preparatory program; however, it is required that he show an aptitude for business and related subjects and complete his secondary school curriculum with high scholastic standing.

Electrical Engineering, Mechanical Engineering and Chemistry:

Required subjects — 10 units

English	4 units	
Algebra	2 units	
Plane Geometry	1 unit	
U. S. History	1 unit	
Physics	1 unit	including lab.
Chemistry	1 unit	

Textile Design and Fashion

Required subjects — 7 units

English	4 units
U. S. History	1 unit
Science	1 unit
Mathematics	1 unit

Textile Technology:

Required subjects — 8 units

English	4 units
Algebra	1 unit
Plane Geometry	1 unit
U. S. History	1 unit
Physics or Chemistry including lab.	1 unit

Mathematics:

Required subjects — 11 units

English	4 units	
Algebra	2 units	
Plane Geometry	1 unit	
Trig. & Solid Geometry	1 unit	
U. S. History	1 unit	
Physics	1 unit	including lab.
Chemistry	1 unit	

Since each applicant is considered individually, the Director of Admissions may take exception in unusual cases to any of the requirements.

Advanced Standing

Undergraduates of other recognized colleges who apply for admission to New Bedford Institute of Technology as transfer students with advanced standing must present an official statement of honorable dismissal, a transcript of college record and a marked copy of the college's catalog to describe courses completed and offered for transfer credit. Only those courses will be accepted which fit the curriculum requirements of the Institute, and for which the earned grade was "C" or better.

Scholastic Aptitude Test Information

The Scholastic Aptitude Test of the College Entrance Examination Board is required in order that the Director of Admissions may better evaluate the student's ability to succeed at the collegiate level.

Candidates should make application by mail to the College Entrance Examination Board, P. O. Box 592, Princeton, New Jersey. Applications must be made early enough to allow sufficient time for the scheduling of each test. Each application submitted for registration must be accompanied by the examination fee of $5.00.

The Board will report the results of the tests to the colleges indicated on the candidates' application. Candidates do not receive a report of their test scores directly from the Board.

STUDENT EXPENSES

Tuition and General Fees

Tuition for all courses varies according to the residential status of the student. For residents of Massachusetts, the rate is $100.00 a semester for a full-time student; for all others, the rate is $10.00 per credit hour. A full-time student is one taking ten or more credits a semester. For residents of other states, the fee is $125.00 a semester. The rate for all foreign students is $250.00 a semester.

All prospective students must pay a fee of $10.00 when submitting their applications for admission. This fee (non-returnable) may be applied toward tuition in the event of matriculation.

LABORATORY AND SPECIAL FEES (for one academic year)

Athletics	$15.00
Student Activities	10.00
General Laboratory fees for all students	10.00
General Laboratory fee for 2nd, 3rd, and 4th year Chemistry major students	20.00
Chemical fee (additional fee for all out-of-state and foreign students)	10.00
Graduation fee—all seniors	20.00

Registration fee (non-returnable) but applied to tuition in the event of matriculation	15.00
Registration fee (foreign students) (non-returnable) but applied to tuition in the event of matriculation	50.00
Late registration fee	5.00
Books and supplies—Freshmen (estimated)	150.00
Books and supplies—Upperclassmen (estimated	100.00
Library fee	5.00

Refunds

Any student withdrawing during the first six weeks of the semester is eligible to receive a refund according to the following schedule:

Requests	Refunds
Less than one week	100%
Less than two weeks	80%
Between two and six weeks	40%
After six weeks	0%

STUDENT REGULATIONS

Conduct

It is assumed that students matriculating in any one of the various programs offered by the Institute have attained sufficient maturity and developed those attributes conducive to an adequate preparation for professional careers. This means that the administration at the Institute expects that each student will have developed an ability to get along well with others and to maintain a personal high standard of honesty and moral conduct. The Institute has not established any rigid rules restricting the conduct of individuals or groups of students. However, it will be understood that a student may be dropped from the rolls or subjected to other disciplinary action, for conduct which is illegal, immoral, or not in keeping with the best interest of the Institute.

Attendance

Every student is expected to be present at all lectures and laboratories for which he is registered, unless a satisfactory excuse can be presented for his absence. Excessive absence will result in disciplinary action which may lead to loss of credit for a course, suspension or dismissal.

Withdrawals

A freshman is not permitted to withdraw from a course.

An upperclassman is permitted to withdraw from a course, without penalty, only during the first six weeks of the semester and with permission of his faculty advisor and the Dean of Students. After the first six weeks and with permission of the faculty advisor and Dean of Students, an upperclassman is permitted to withdraw from a course with penalty, that is, WP (withdrew passing) or WF (withdrew failing). A withdrawal from a course without permission incurs a grade of F (failing).

A student withdrawing from the Institute must first consult with the Dean of Students. Failure to do so may prevent the Institute from giving the student a certificate of honorable dismissal.

Eligibility

A student placed on scholastic probation is not eligible to participate in athletics or hold an elective office in non-athletic activities.

GRADING SYSTEM AND HONORS

Grading System

At the completion of a course the student receives toward graduation the number of semester hour credits at which the course is rated. The level of performance in the course is indicated by a letter grade: A, superior; B, above-average; C, average; D, passing, but not satisfac-

tory; F, failing; Inc., Incomplete; WF, withdrew failing; WP, withdrew passing. The arithmetical equivalents of the letter grades are A, 90-100; B, 80-89; C, 70-79; D, 60-69; F. below 60.

A student can obtain credit for an Incomplete only by finishing the work of the course before the end of the fourth week following the completion of the course. A grade of Incomplete will be automatically converted to a failure if the course requirements has not been satisfied by this time. The initiative in arranging for the removal of the Incomplete rests with the student.

A deficiency resulting from failure may be removed by: repeating the course the next time it is scheduled, or securing transfer credit in a comparable course from some other accredited institution. Only grades of "C" or better are accepted for transfer credit. Such courses for transfer must be approved in advance by the Registrar. When a subject which has been failed is repeated at the Institute, the new grade is entered on the student's record in addition to the original grade.

Quality Point Average

Beginning with the class entering in September 1959 the following Quality Point System went into effect.

The student's semester quality point rating is a weighed value used to denote his relative standing. The point values assigned are A = 4 points, B = 3 points, C = 2 points, D = 1 point and F = 0 points. These point values, when multiplied by the credit hours assigned to the subject and added together, are divided by the sum of the credit hours to give the student's semester rating. The cumulative rating for more than one semester will be obtained in the same manner as the computation for the rating of a single semester.

If a student repeats a course, both grades are entered on his record and the quality points and credit hours corresponding to each are considered in computing the average.

Credit granted for work taken at another institution is not included in the quality point average.

The quality point average for the term will be computed at the end of each term. The summer session is not considered as a term, and grades earned in summer session courses are included only in the cumulative quality point average.

A. A course in which a D grade is obtained may be repeated for credit only with permission of the department head and the dean of students.

Audit: A course in which a passing grade is obtained may, at the students discretion, be audited; in this case, the transcript will indicate that the course was audited but no grade and credit received.

Repeat: On the initiative of the faculty, a course in which a passing grade is obtained may be repeated; in this case, the student must

attend all classes and examination periods; a grade but no credit will appear on the transcript.

Dean's List

A student who, at the end of a semester, has a high scholastic standing will be placed on the Dean's list. This list will be posted on the official bulletin board.

Degrees with Distinction

Students completing graduation requirements with exceptionally high scholastic records are graduated with distinction; that is, with distinction, with "high" distinction, or with "highest" distinction.

C. A student transferring credits from another college, to be eligible for graduation with distinction, must have earned his junior-senior credits at the Institute.

GRADUATION REQUIREMENTS

To qualify for graduation, a candidate must satisfy the following requirements:

The satisfactory completion of all courses in one of the prescribed curricula.

A cumulative quality point average of not less than 2.00.

The completion of two years of residence as a full-time student at the Institute. A full-time student is one who is carrying not less than 10 credits per semester. It is the policy of the Institute that the senior year be in residence.

Library

The library is under the supervision of a full-time professional librarian and contains approximately 25,000 volumes as well as audiovisual materials. By gift or subscription the library receives 300 publications issued periodically. These include magazines, journals, publications of professional societies, and house organs of industrial organizations.

The library, located on the third floor of the Library and Art-Building, consists of the library proper, an audiovisual room (The Bishion's Room) and a projection room. Hours are from 8:00 A.M. to 4:00 P.M., Monday through Friday and from 7:30 P.M. to 9:30 P.M. Monday through Thursday. Professional reference assistance is available 30 hours a week.

The Institute has established inter-library loan privilege with the New Bedford Free Public Library and can borrow freely from its book collection of 300,000 volumes. In addition, the facilities of this large municipal library are available without cost to all students at the Institute whether or not they are residents of New Bedford.

Bookstore

The Institute's bookstore is located on the first floor of the Art and Library building. Here the student will find all the approved books and supplies for all courses offered by the Institute.

Students, although not required to purchase materials from the bookstore, are advised not to buy elsewhere without first obtaining approval from their instructors.

All proceeds from the bookstore, after operating costs have been met, are used to provide student services at the Institute.

Housing

Dormitory facilities are not provided by the Institute. For non-residents, however, excellent accommodations with private families living within walking distance of the Institute are readily available. A list of approved rooms is maintained and arrangements may be made through the Institute to secure suitable living quarters. Accommodations for fraternal brothers of Phi Psi, Delta Kappa Phi and Nu Beta Tau are available at their respective fraternity houses.

Lounges

Two lounges are maintained for student use; one is located in the Art and Library building, and the other, in the Engineering and Science building.

Both lounges are suitably furnished with chairs, tables, television sets, and refreshment dispensers. The lounges are used by all students for relaxation and for social contact.

Guidance and and Counseling

Because the Institute is a small college, a close personal relationship is maintained between the student body and the faculty. Through the Dean of Students and the Faculty Advisors, assistance is given to students during the year in the scheduling of their classes and in solving problems which may arise during the year. Whenever it is deemed necessary, correspondence and interviews are entered into between the Dean of Students and families of those students whose performance is not considered satisfactory.

The freshman year begins with a Freshman Orientation Period immediately preceding the Fall Term. Registration, general intelligence and aptitude tests are completed, orientation lectures on campus and professional life are given. Interpretive results of the intelligence and aptitude tests are available to the students, to the Dean of Students, and to the faculty advisors to aid in the making of decisions throughout the student's college career.

An average of one and one-half hours of preparation for each hour of lecture or recitation will be required of freshmen.

Each student's performance is evaluated four times during the academic year; that is, his scholastic standing is obtained at the end of the first eight weeks and at the end of each semester. This procedure is followed in order to allow the administration to inform the student of his standing and advise him more effectively as to the need for remedial action should such action be required.

Psychological Services

A counseling service is provided by the school for students with problems of personal adjustment. Such students may be referred to this service by faculty members, advisors, or others on the college staff, or they may seek consultation directly.

Placement

A Student Placement Service is maintained at the Institute on a full-time basis. The main purpose of this office is to aid and assist the graduating students to secure positions in their chosen fields of endeavor. This office keeps abreast of the needs of the various industries and passes this information along to the graduates.

The Placement Officer arranges for all on-campus interviews and helps both the visiting officials and the students to get the most out of such on-campus interviews. The graduate can also find many application forms for employment with various concerns in the Placement Office. Also he is allowed to utilize many of the College Directories and Placement Annuals which list possible employment offers that are housed in the College Placement Office at Tech.

The U. S. Government listings are also posted weekly and many of Tech's graduates have gone into one of the many departments of government work. The government also has employed many of our students for summer-time work in their various fields and this information is also passed on to the underclassmen.

The Placement Service is not a guarantee of employment but it does serve the graduate toward successfully positioning himself. In addition to student placement the service is also extended to Alumni members who are desiring a change of position or re-location. The Placement Office handles all requests for experienced personnel through the Alumni membership.

ENDOWMENTS AND SCHOLARSHIPS

The New Bedford Institute of Technology offers to its undergraduates a number of scholarships made possible through the generosity of private and industrial endowments. All scholarship awards are made on the recommendation of the Scholarship Committee of the Faculty or of the committee appointed by the individual or organization establishing the scholarship. Applications for scholarships and financial assistance should be made to the Dean of Students.

The following tuition scholarships are available to undergraduates.

Commonwealth of Massachusetts Scholarships

The General Court of the Commonwealth has now available to residents of the Commonwealth five four-year tuition scholarships. These scholarships are granted to both upperclassmen and entering freshmen in all curricula.

Ivy Circle of the New Bedford Women's Club Textbook Scholarships. Several textbook scholarships are awarded annually by the Ivy Circle of the New Bedford Women's Club to students in all curricula.

Earl Randolph Corporation. A one-hundred dollars award available to all textile majors.

William Firth Scholarship. A one-hundred-dollar tuition scholarship made available from the William Firth Memorial Fund. Available to students in all courses.

The Manning Emery, Jr. Scholarship. A one-hundred-dollar tuition scholarship made available from the Manning Emery, Jr. Memorial Fund. Available to students in all courses.

Aerovox Scholarships. Two two-hundred-dollar annual awards to students majoring in mechanical or electrical engineering or chemistry. Preference will be given to close relatives of Aerovox employees. Also available to entering freshmen students.

Acushnet Process Scholarships. Two one-hundred-dollar tuition scholarships to students in mechanical or electrical engineering or chemistry. Available to residents of greater New Bedford and preference will be given to close relatives of Acushnet Process employees.

Berkshire-Hathaway Inc. Scholarships. Two two-hundred-dollar awards to students majoring in textiles who have indicated an interest in pursuing their textile careers in New England.

Morse Twist Drill Scholarships. A one-hundred-dollar tuition scholarship to a student in mechanical or electrical engineering or chemistry. Preference to alumni or active members of Junior Achievement.

Barnet D. Gordon Family Foundation Scholarship. A fifty-dollar grant to students majoring in any of the textiles curricula.

Revere Copper and Brass. Two two-hundred-dollar awards to students majoring in mechanical or electrical engineering or chemistry.

J. C. Rhodes Scholarship. Four one-hundred-dollar awards to students in mechanical or electrical engineering or chemistry.

Sandoz Chemical Scholarship. A two-hundred-dollar tuition scholarship to a student in textiles.

Everett H. Hinckley Scholarship. A two-hundred-dollar scholarship made available by the New York Club of the New Bedford Institute of Technology Alumni Association. It is awarded to a textile major in memory of Everett H. Hinckley, former head of the Institute's Chemistry Department.

Chemstrand Corporation Scholarship. Two two-hundred-and-fifty dollar tuition scholarships are awarded each year to students majoring in textile technology or in textile chemistry.

City of New Bedford Scholarships. Under an ordinance of the City of New Bedford, five four-year tuition scholarships are awarded each year to seniors of the New Bedford High School, Holy Family High School, Vocational High School and St. Anthony High School. These are distributed as follows: two to seniors of New Bedford High School, one to each of the other schools.

Abraham S. Novick Memorial. A one-hundred-dollar grant awarded annually and available to students in all curricula.

Allied Chemical. A one-hundred-dollar scholarship available to all chemistry majors.

New Bedford Plating Corporation. A one-hundred-dollar award available to all textile majors.

Robert J. Swain Memorial Scholarship. A one-hundred-and-fifty dollar scholarship available to Business Administration majors.

New Bedford Institute of Technology Alumni Association Scholarships. Several scholarships of varying amounts available to students in all curricula.

The Abram Holland Memorial Scholarship. One-hundred-dollars awarded annually to a business administration student entering his junior year.

Several other scholarships are available under the auspices of the Scholarship Fund of the New Bedford Institute of Technology.

STUDENT AWARDS

The following awards are made annually:

Northern Textile Association Medal. The Northern Textile Association offers a medal, to be awarded each year to the student in the Textile Engineering graduating class who shows the greatest proficiency in scholarship. This is determined by an examination of all students records and the medal is awarded to that student having the highest average according to the credit point system of determining averages.

The competition for this medal is also open to all evening students who have completed the full course of study required for a degree in Textile Engineering. The association offering the medal has made it a condition of the award that at least four members of the graduating class be eligible to the competition.

The William E. Hatch Award. This award is made to the member of the freshman class of Textile Engineering, who has the highest credit point average for the year. It is awarded by the Alumni Association of the Institute, to commemorate the day of William E. Hatch's retirement from the presidency of the Institute. This award is sponsored by the Alumni Association.

The Morris H. Crompton Award. This award is made to the student of the graduating class of Mechanical Engineering, who has the highest four-year average according to the credit point system of determining averages. It is awarded in honor of Morris H. Crompton, former head of the Department of Engineering. This award is sponsored by the Alumni Association.

The Fred E. Busby Award. This award is made by the Alumni Association to the student of the graduating class of chemistry, who has attained the highest four-year average according to the credit point

system. It is presented in honor of Fred E. Busby, former head of the Department of Chemistry.

The American Association of Textile Chemists and Colorists Award. This award is presented annually to the outstanding senior in the Textile Chemistry Course. The award is in a form of a book.

The Samuel Holt Designing Award. This award is sponsored by the Alumni Association. Presentation is made, annually, to a graduating student in recognition of excellence in Textile Designing. The award is made as an expression of appreciation and grateful acknowledgment on the part of the Alumni in Mr. Holt's honor. Mr. Samuel Holt, former head of the Designing Department retired from the faculty in 1938. He is respectfully remembered by all who studied under him for his kindness, patience, understanding and ever-willing desire to assist the individual student just a little bit more.

The American Association of Textile Technologist Award. The basic objective of the American Association of Textile Technologists is to encourage in the broadest and most liberal manner the advancement of textile technology. The furtherance of this objective is certain progress by the Association's encouragement in the field of textile education.

In order to fulfill this objective, the American Association of Textile Technologists is presenting the plaque to an outstanding student, who has been selected by the faculty of the New Bedford Institute of Technology as that member of the graduating class who as an undergraduate has shown outstanding achievement in scholarship, technical ability, industry, judgment, leadership, reliability and ability to work and cooperate with others.

The Phi Psi Award. The Phi Psi Award is a beautiful pocketbook and leather case set made of ostrich leather and lined with calfskin. Each article is embossed with the coat of arms of the fraternity, also the recipient's name in gold. In addition, he is presented with a suitably engraved certificate, certifying the honor that has been given him. This award is presented, regardless of fraternity affiliations to the outstanding graduating student on the basis of his scholastic standing which includes analytical powers, accuracy and reliability. In addition he must be possessed with leadership, initiative and personality.

The Delta Kappa Phi Award. The Delta Chapter of the Delta Kappa Phi Fraternity, the oldest professional textile fraternity in the world, sponsors this award. This trophy and its accompanying certificate is awarded annually to the member of the graduating class who, in the opinion of the selection committee, has done the most for New Bedford Institute of Technology in athletics during his four years here. His qualities of leadership, sportsmanship and fair play are all considered.

The Kappa Sigma Phi Award. This award is given annually by the Kappa Sigma Phi Sorority, to the graduating female student who, in

the opinion of the members of this sorority is outstanding in scholastic achievement, leadership, initiative and personality.

Textile Veterans Association Award. This award is presented by the Textile Veterans Association to the outstanding veteran in the graduating class majoring in a textile course. His standing is determined by an examination of all students records. His qualities of leadership, sportsmanship and fair play are all considered.

Design and Fashion Award. A citation of excellence presented annually to a graduate who has majored in Textile Design and Fashion. This award is sponsored by the Alumni Association.

Electrical Engineering Award. A citation of excellence presented annually to a graduate who has majored in the Electrical Engineering Course. This award is sponsored by the Alumni Association.

Mathematics Achievement Award. This award, a book of standard mathematical tables, is sponsored annually by the Chemical Rubber Company and presented to a member of the freshman class for excellence in freshman mathematics.

AWARDS

New Bedford Exchange Club Book Awards

Four book awards sponsored by the Exchange Club of New Bedford are awarded annually in recognition of excellence in scholastic achievement to students matriculating in Business Administration. There are awarded to Juniors attaining the highest scholarship in Accounting, Marketing and Management and to a Freshman achieving the highest scholarship in Accounting.

Physics Achievement Award. The current edition of the HANDBOOK OF CHEMISTRY AND PHYSICS is awarded to the engineering major achieving the highest standing in physics. This prize is presented annually by the Chemical Rubber Company.

The Institute of Radio Engineers Award. This award is made to an outstanding senior in engineering or science. The basis for this award is professional development, activities in the AIEE-IRE Joint Branch, original work, scholarship, and meritorious extra-curricular activities. The award is an engraved certificate and one year's membership in the parent IRE organization. One or more students may also receive Honorable Mention.

The Institute of Electrical and Electronics Engineers Outstanding Senior Award. This award is made to an outstanding senior in engineering or science. The basis for this award is professional development; activities in the IEEE Student Branch with focus on contributions to the membership campaign of the branch and work spent in developing and presenting program throughout the year scholarship; and meritorious extra-curricular activities. The award is an engraved certificate and one

year's membership in the parent IEEE organization. One or more students may also receive Honorable Mention.

The Institute of Electrical and Electronics Engineers Scholarship Awards. These awards are made annually to outstanding engineering or science students who are members of the I.E.E.E. Student Branch. Each one-hundred-dollar award is presented to a student who has shown outstanding scholastic achievement and service to the student branch.

The Bernice Walder Arenberg Member Scholarship Award is a beautiful trophy which is awarded to the sorority or fraternity with the highest cumulative point average. The organization which can win for three consecutive years will retire the trophy permanently.

STUDENT ORGANIZATIONS

The following organizations are available at the Institute for student participation:

Business Management Club

The Business Management Club was formed in May of 1961. Its membership is comprised solely of Junior and Senior majors in Management who are interested in broadening their business background. The relatively small size of this group makes it possible to hold numerous informal group discussions, as well as luncheon meetings with prominent local business leaders.

In its first year, the club was selected to organize and coordinate the activities of the Area Opportunity Employment Conferences in conjunction with the Placement Office and the Department of Business Administration. Since that time the club has sought National affiliation with both the American Management Association and the Society for the Advancement of Management.

Its current aims are to inform and stimulate interest among local and area concerns with the quality and achievements of Tech's Business Administration graduates.

Camera Club

An organization for all students interested in photography as a hobby. A well-equipped darkroom is available for processing and the application of most photographic techniques. Color processing equipment is being added as rapidly as possible. Many of the photo illustrations for the student publications and the yearbook are handled by the Camera Club.

Circle K Club

This organization is sponsored by Kiwanis International. It is a service organization similar to Kiwanis and other service clubs. It serves

at the college level. It is a character building group which offers service on the campus, to the school and to the community.

College Glee Club

For all students interested in music, a Glee Club has been organized. The Glee Club is supported by the Student Council. The purpose of the Club is to furnish both a musical and social outlet to its members, who meet weekly with a capable director, preparing a repertoire of songs for different functions during the school year.

The Marketing Society

This organization attempts to acquaint students with unique problems and considerations in certain distributive areas of the business world. To do this, the officers and members employ such media as field trips, movies, luncheon speakers, and various company representatives. Membership is open to all Business Administration students.

Mainstay

The Mainstay is the College Yearbook published by and for all students at the Institute. This Yearbook provides for the most part a pictorial record of all classes and of all principal events of the school year.

International Students' Organization

The International Students' Organization (I.S.O.) has for its primary purpose the promotion of fellowship between Americans and foreign students enrolled at Tech and the growth of better understanding of world problems. The I.S.O. wishes to hold out a helping hand to all foreign guests enrolling at Tech and urges them to make themselves known to the organization in order that it may be of immediate assistance to them. The club also welcomes all interested local students.

Fraternal Societies

The Institute has three national, professional and social men's fraternities. These are Phi Psi, Delta Kappa Phi, and Nu Beta Tau.

There are two women's sororities at the Institute, Kappa Sigma Phi and Chi Delta Phi. These organizations all play a major role in the social and athletic affairs of the Institute and are governed to some extent by the Interfraternity Council.

The Interfraternity Council consists of members from each fraternal organization and an advisor chosen from the faculty. This body determines the rules governing rushing and the scheduling of events; it also enforces all Institute rules regarding membership in fraternities.

Professional Societies

American Chemical Society. This organization is devoted to the academic as well as the professional development and advancement of the chemistry student. These goals are approached by presenting technical movies, sponsoring industrial tours, and offering lectures which are of primary interest to him. This club is affiliated with the American Chemical Society, and membership in the club is open to all chemistry majors.

American Association of Textile Chemists and Colorists. This chapter is a student unit of the national organization whose student membership is open to students who are preparing for a career in the application of dyes or chemicals in the textile industry, in the manufacture and research of these products, or in the testing of textile materials. It holds regular meetings of its own, and participates in the activities of the regional section, (The Rhode Island Section) of the parent organization.

The Institute of Electrical and Electronics Engineers. A consolidation of the American Institute of Radio Engineers, Inc., the student branch was established at New Bedford Institute of Technology on February 2, 1956. The objectives of the I.E.E.E. Student Branch are to provide an organization through which the technical development and the ideas of the engineering profession outside the classroom may be shared with students and to provide the student with the opportunity to contribute toward the advancement of professionalism in engineering. To further these goals, the student branch sponsors events as the Freshman-Branch Mixer, the annual Electronics Week Celebration, and dinner meetings. The student branch sponsors bi-monthly speaker programs and publishes its own newspaper. Any engineering or science student registered in a four-year course is eligible for membership.

Mechanical Engineering Club. This organization is available to students in the Sophomore, Junior and Senior classes majoring in Mechanical Engineering. The purpose of this group is to develop in the student a better concept of industries' problems, and the benefits of affiliation with professional engineering societies. This is accomplished by sponsoring technical sessions, arranging plant tours, attending joint meetings with professional societies, and holding dinner meetings with industrial representatives as invited guests.

American Association of Textile Technologists. The purpose of this organization is to bring about a more intimate relationship between the textile industry and undergraduates majoring in the field of textiles or related areas.

Religious Groups

Newman Club. The Newman Club is an organization of Catholic college students dedicated to the wider application of the teachings of

the Catholic Faith to their private and social lives. The Club has a chaplain to minister to the spiritual needs of the members. This organization is affiliated with the National Federation of Newman Clubs.

Protestant Youth Fellowship. This is an organization of Protestant college students whose purpose is to instill in its members a greater appreciation and need for applying to their lives the precepts of the Protestant Faith.

Student Council

This is a body of elected representatives from each of the four classes, and one faculty representative. Its purpose is to study problems of the student body, class activities, and the various matters of student organization. The council represents the student body in proposing changes or making recommendations to the college authorities.

Tech Talk

Tech Talk is the official student publication on campus. It is managed and published solely by student effort. A faculty member is appointed by the administration to act as an advisor to the group. This publication appears monthly and it is supported in greater part by a portion of the student's activities fee. The purpose of this publication is to make available to the student body a channel for expression and information.

ATHLETICS

The New Bedford Institute of Technology, its administration and faculty, approve and encourage a full program of intercollegiate and intramural athletics. The Athletic Council plans and provides for the fullest possible program of intraclass and intrafraternity sports. This organization, composed of representatives of both the Board of Trustees and the faculty, also determines athletic policies, budgets for each sport and approval of all sport schedules.

Varsity teams include baseball, basketball, tennis and soccer. The Institute schedules for its games most of the recognized colleges within its athletic class. The Institute is an active member of the National Association of Intercollegiate Athletics and of the Southern New England Coastal Conference.

OFFICE OF PUBLIC RELATIONS

The Office of Public Relations at the New Bedford Institute of Technology is under the Direction of Mr. James A. Flanagan. This office handles all of the publicity material for the school and makes regular releases to newspapers and radio stations. A system of intra-college communication also is maintained for the benefit of students and faculty.

Through its release and various publications and brochures the Office of Public Relations endeavors to further the aims of the college in

every possible way, to create a better understanding of the Institute and higher education in general, to keep the public informed of worthwhile college activities and of individual and group accomplishments, to acquaint prospective students with the college and to assist in their orientation upon enrollment and to further the Institute's reputation as a good neighbor and as an essential part of the community.

In addition to regular news from the college, the Office of Public Relations handles all of the sports news of the four varsity athletic teams. Three brochures are prepared annually and sent to dozens of news agencies throughout the state and country. This office works in conjunction with the newspaper and radio stations to keep the community informed of the different college sports attractions that are presented throughout the year.

Close working contact is maintained with the many student organizations in the college in order that they may receive the proper amount of publicity and that their efforts may be well coordinated. Through this office also, the Tech Alumni is kept fully informed by means of a monthly newsletter of the developments and advances of their Alma Mater.

RESEARCH FOUNDATION

In May, 1957, the Massachusetts State Legislature authorized the establishment of the New Bedford Institute of Technology Research Foundation. This Foundation marks a recognition of the excellent facilities and personnel available at the Institute to aid private industry and governmental organizations in the fields of Business Administration, Chemistry, Engineering and Textiles.

The aims of the Foundation are to cooperate with groups such as those mentioned above and to aid them by conducting research, development, and consulting programs. The Foundation also serves to further the knowledge of its research staff and to utilize this knowledge, both practically and theoretically, in meeting successfully the aims and objectives of the Foundation.

During the past few years research projects have been completed for the U. S. Army Research Command, Borne Chemical Co. of New Jersey, Owens Corning Fiberglas Corp., Bristol Research Associates and Aerovox Corp. All testing and analysis work performed by the various professors is now channeled through the Foundation.

Recent research contracts negotiated and now in full operation are "Study of the Scallop and Flounder Industry" a $90,000 Contract. This contract is being processed by the Business Administration Department and Mechanical Engineering Department for the Area Redevelopment Administration, United States Dept. of Commerce of the U. S. Government.

Also "Study of Fiberglas Yarn and Blends" a $5,000 contract with Owens Corning Fiberglas Corp. This contract is being processed by the Textile Engineering Department.

ALUMNI ASSOCIATION

The Alumni Association of the New Bedford Institute of Technology has a twofold purpose: In its social aspect it serves to continue and renew the friendships and feelings of comradeship which all alumni felt as students; from a service viewpoint it aids the administration of the Institute by bringing to its attention those curricula omissions and/or changes which would up-grade the standards of its graduates; the association serves the alumni as a focal point for placements; it serves as a clearinghouse for news about, and of interest to, the alumni; it helps the Institute in those cases where alumni financial aid can be of the utmost assistance; and it furnishes both the administration of the Institute and all alumni a common and unifying point of contact.

All who have spent a minimum of the equivalent of one academic year at the New Bedford Institute of Technology are considered alumni of the Institute.

The Alumni Association maintains an up-to-date file of all graduates. Each month during the academic year every alumnus receives a News-Letter that brings him the latest information about the Institute and the activities of the alumni. At the end of May each year, the Alumni Association has an Alumni Reunion Weekend to which alumni come from far and near to renew acquaintances and see at firsthand the progress being made at Tech.

Further information can be obtained by contacting James F. Flanagan '47, Secretary, at the New Bedford Institute of Technology.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Undergraduate Courses of Study

Seven undergraduate curricula with majors in eleven fields leading to the Bachelor of Science degree are offered by the Institute:

Business Administration

Chemistry

Design and Fashion

Electrical Engineering

Mathematics

Mechanical Engineering

Textile Technology

The curricula which are outlined in the following pages have been arranged according to fields of interest—i.e. business administration, chemistry, engineering, mathematics, and textiles. Curricula are under continuous study and are subject to change whenever the Institute feels that such change would benefit both student and industry.

BUSINESS ADMINISTRATION

Economic productivity and progress are dependent to a considerable extent upon sound and effective business management. As industry and our economy expand, education for business at the collegiate level becomes more significant. Collegiate instruction in business administration, according to the American Council on Education, is now being offered in more than five hundred institutions of higher learning in the United States. A recent report of the United States Office of Education stated, "Collegiate education for business has had one of the fastest—if not the fastest—growths of any of the areas of higher education and today constitutes an important and significant part of collegiate instruction."

In recognition of these facts, the Board of Trustees at the Institute voted in 1958 to add to the curricula a complete program in Business Administration. The program was inaugurated with a freshman class of seventy students in September of that year. The Massachusetts Board of Collegiate Authority has approved this new curriculum and the award of the degree of Bachelor of Science in Business Administration to all students who complete the four years of prescribed study.

The Business Administration curriculum offered at the Institute reflects the increasing awareness in industry of the fact that merely technically-trained personnel are not adequate to meet the changing needs of world economy. It recognizes that the ultimate aim of education is to produce an intellectually and emotionally mature person with a sound sense of values as well as competence in technical skills. Consequently, the new curriculum incorporates the standard adoption by the American Association of Collegiate Schools of Business that at least forty per cent of the total hours

required for the Bachelor's degree must be in the area of general or liberal arts education and at least forty per cent in the area of business administration. Its specific objective will be the education of students to their fullest potential for competence in business and effectiveness in civic life.

This course of study is planned to aid students in preparing for positions of responsibility in business. During the first year fundamental courses in English, mathematics, accounting, physical and social sciences, and a basic course in economics are required. After completion of the year, students are permitted a choice of three major fields for continuing study: Accounting, Marketing, or Management. At this point, aptitude and ability of the student, as well as his interest in subject matter of the curriculum, are re-examined with his advisers for the purpose of providing proper guidance in the selection of his major field, a matter of primary importance.

Accounting

The need for personnel trained in the skillful application of accounting principles has become increasingly apparent in all lines of industry and business. The accurate interpretation of financial reports and the necessity for efficiency as well as competence in record keeping for business are considered of paramount importance to business management. Accounting is often considered the "backbone" of management. Public, private, institution and government accounting present almost unlimited opportunities for the practice of the skilled accountant. Opportunities for women as well as men are rapidly increasing.

Marketing

The sale and distribution of the products of industry and the many public and private services necessary to the economic life and progress everywhere provide a great many people with absorbing and lucrative vocations. Trained personnel in these fields may progress faster and further than those who have not had the opportunity for study at the collegiate level.

The marketing program provides specialized training in the technicalities of buying as well as selling. Market research, government regulation of business, taxation, insurance and management principles are included in addition to the required core curriculum.

Management

The course of study here is aimed to assist the young man or woman who is interested in preparing to assume responsibilities in business that may lead to junior executive or management positions. The possibility of proprietorship interest in his own or his family's business is also considered. Study in the management major should facilitate advancement toward top executive positions following some years of business experience. This program of study includes fundamental courses in accounting, business law, principles of management, labor relations, government regulation of business, effective speaking and seminars in the problems of business.

Business Administration Program

FRESHMAN YEAR

First Semester		*Credit Hours*
E-101	English Composition and Literature	3
M-111	Introductory Mathematics I	3
SS-240	Government	3
CH-114	Biological Science	3
BA-101	Basic Accounting*	4
		16

Second Semester		*Credit Hours*
E-102	English Composition and Literature	3
M-112	Introductory Mathematics II	3
CH-115	Biological Science	3
BA-102	Basic Accounting*	4
SS-110	General Psychology	3
SS-322	Economic History of the United States	3
		19

*Three lectures, one two- hour laboratory each week.

SOPHOMORE YEAR
MARKETING AND MANAGEMENT MAJORS

First Semester		*Credit Hours*
BA-203	Effective Communication	3
SS-220	History of Western Civilization I	3
SS-230	Principles of Economics	3
L-201	Modern Language	3
BA-211	Managerial Accounting	3
BA-205	Marketing Principles	3
		18

Second Semester		*Credit Hours*
BA-204	Effective Communication	3
SS-221	History of Western Civilization II	3
SS-232	Economic Problems and Policies	3
L-202	Modern Language	3
BA-212	Managerial Accounting	3
BA206	Marketing Management	3
		18

ACCOUNTING MAJOR

First Semester		*Credit Hours*
BA-203	Effective Communication	3
SS-220	History of Western Civilization I	3
SS-230	Principles of Economics	3
L-201	Modern Language	3
BA-201	Intermediate Accounting	3
M-101	Algebra and Analytic Geometry	4
		19

Second Semester		*Credit Hours*
BA-204	Effective Communication	3
SS-221	History of Western Civilization II	3
SS-232	Economic Problems and Policies	3
L-202	Modern Language	3
BA-202	Advanced Accounting	3
M-212	Mathematics of Finance	3
		18

NOTE: At the end of the freshman year, students elect one of the three major areas for continuing study.

JUNIOR YEAR—ACCOUNTING MAJOR

First Semester			*Credit Hours*	*Second Semester*			*Credit Hours*
M	311	Statistics	3	M	312	Statistics	3
BA	309	Insurance	3	BA	310	Real Estate	3
L	301	Modern Language	3	L	302	Modern Language	3
BA	301	Cost Accounting	3	BA	302	Cost Accounting	3
BA	303	Business Law	3	BA	304	Business Law	3
		Socio-Humanistic Elective	3			Socio-Humanistic Elective	3
			18				18

JUNIOR YEAR—MARKETING MAJOR

First Semester			*Credit Hours*	*Second Semester*			*Credit Hours*
BA	309	Insurance	3	BA	310	Real Estate	3
L	301	Modern Language	3	L	302	Modern Language	3
BA	303	Business Law	3	BA	304	Business Law	3
BA	305	Advertising and Selling	3	BA	306	Advertising and Selling	3
TE	309	Materials and Fabrics	3	TE	310	Materials and Fabrics	3
		Socio-Humanistic Elective	3			Socio-Humanistic Elective	3
			18				18

JUNIOR YEAR—MANAGEMENT MAJOR

First Semester			*Credit Hours*	*Second Semester*			*Credit Hours*
BA	309	Insurance	3	BA	310	Real Estate	3
L	301	Modern Language	3	L	302	Modern Language	3
BA	303	Business Law	3	BA	304	Business Law	3
BA	301	Cost Accounting	3	BA	302	Cost Accounting	3
BA	307	Management Principles	3	BA	308	Management Principles	3
		Socio-Humanistic Elective	3			Socio-Humanistic Elective	3
			18				18

SENIOR YEAR—ACCOUNTING MAJOR

First Semester			*Credit Hours*	*Second Semester*			*Credit Hours*
E	401	Technical Report Writing	3	E	402	Effective Speaking	2
BA	401	Auditing	3	BA	402	Auditing	3
BA	403	Taxation	3	BA	404	Taxation	3
BA	409	Business Policy Seminar	3	BA	410	Business Policy Seminar	3
BA	413	Labor-Management Relations	3	BA	212	Marketing Management	3
		Socio-Humanistic Elective	3			Socio-Humanistic Elective	3
			18				17

SENIOR YEAR—MARKETING MAJOR

First Semester			*Credit Hours*	*Second Semester*			*Credit Hours*
E	401	Technical Report Writing	3	E	402	Effective Speaking	2
BA	407	Market Research	3	BA	408	Market Research	3
BA	413	Labor-Management Relations	3	BA	414	Labor-Management Relations	3
BA	403	Taxation	3	BA	404	Taxation	3
BA	409	Business Policy Seminar	3	BA	410	Business Policy Seminar	3
		Socio-Humanistic Elective	3			Socio-Humanistic Elective	3
			18				17

SENIOR YEAR—MANAGEMENT MAJOR

First Semester			*Credit Hours*	*Second Semester*			*Credit Hours*
E	401	Technical Report Writing	3	E	402	Effective Speaking	2
BA	411	Personnel Administration	3	BA	412	Business Fluctuations	3
BA	413	Labor-Management Relations	3	BA	414	Labor-Management Relations	3
BA	403	Taxation	3	BA	404	Taxation	3
BA	409	Business Policy Seminar	3	BA	410	Business Policy Seminar	3
		Socio-Humanistic Elective	3			Socio-Humanistic Elective	3
			18				17

Note: In each of the three major areas in the Business Administration Curriculum, provision may be made for electives in other departments at the Institute for students who indicate special interests and aptitudes. Such elective courses may be arranged by the student in consultation with his faculty adviser and with the Department Heads concerned, and may serve as substitutions for certain required courses.

CHEMISTRY

Chemistry is the study of matter, its properties and transformations. Since all manufacturing industries must start with some form of matter for the fabrication of their finished products, the science of chemistry is fundamental to all industry and for this reason, chemists are employed by many concerns other than those actually manufacturing chemicals. In recent times manufacturing companies are tending more and more to develop, on their own, new materials for specific purposes. As a result, the need for chemists is continually increasing. The advent of the space and atomic age has produced many problems that must be solved by the chemist. For example, development of materials capable of withstanding and insulating against terrific heat, rocket fuels of much greater power, stronger and lighter alloys, and lighter and more efficient materials for shielding against radiation are necessary before engineers can advance very far in space vehicle design.

The chemistry curricula at the Institute are designed to give a solid foundation in the fundamental principles of chemistry and to provide sifficient training in laboratory techniques to form a basis for specialized work in the chemical or allied industrial fields chosen by the student. Courses in the fundamental sciences of mathematics and physics coupled with instruc-

tion in the socio-humanistic studies yield a well-balanced program which prepares the student for industrial careers or for graduate school.

The Institute offers two chemistry curricula leading to a Bachelor of Science degree with a common freshman year program.

FRESHMAN YEAR

First Semester

CH	111	General Chemistry	3 6 5
M	101	Algebra and Analytic Geometry	4 0 4
E	101	English Composition and Literature	3 0 3
SS	230	Principles of Economics	3 0 3
SS	110	General Psychology	3 0 3
			18

Second Semester

CH	112	General Chemistry	3 0 3
M	102	Calculus I	4 0 4
CH	113	Qualitative Analysis	2 4 3
E	102	English Composition & Literature	3 0 3
P	102	Physics I	3 2 4
			17

CHEMISTRY

The Department of Chemistry offers a specialized curriculum leading to the degree of Bachelor of Science in Chemistry. Students are prepared for positions in any chemical field by arranging their course time so that approximately the same number of hours are taken in the four fundamental branches of chemistry, i. e., organic, inorganic, analytical and physical.

SOPHOMORE YEAR

First Semester					*Second Semester*				
CH 211	Quantitative Analysis	2	4	3	CH 212	Quantitative Analysis	2	4	3
CH 231	Organic Chemistry	3	4	4	CH 232	Organic Chemistry	3	4	4
M 201	Calculus II	4	0	4	M 202	Calculus III	4	0	4
P 201	Physics II	3	2	4	P 202	Physics III	3	2	4
L 211	German I	3	0	3	L 212	German II	3	0	3
SS 220	History of Western Civilization	3	0	3	SS 221	History of Western Civil.	3	0	3
				21					21

JUNIOR YEAR

CH 332	Advanced Organic Chemistry	3	4	4	CH 312	Instrumental Analysis	2	4	3
CH 311	Instrumental Analysis	2	4	3	CH 314	Physical Chemistry	4	3	5
CH 313	Physical Chemistry	4	3	5	CH 360	Chemical Literature	3	0	3
L 313	German III	3	0	3		Socio-Humanistic Elect.*	3	0	3
	Socio-Humanistic Elective	3	0	3		Chemistry Elective			3
				18					17

SENIOR YEAR

CH 461	Organic Micro-Quant. Analysis	3	4	4	CH 462	Organic Identification	3	4	4
CH 441	Industrial Chem. Analysis	2	5	4	CH 442	Industrial Chem. Anal.	2	5	4
E 401	Technical Report Writing	2	0	3	E 402	Effective Speaking	2	0	2
	Socio-Humanistic Slective	3	0	3		Socio-Humanistic Elective	3	0	3
	Chemistry Elective			3		Chemistry Elective			3
				17					16

CHEMISTRY ELECTIVES

CH 351	Bacteriology
CH 465, 466	Thesis
CH 401	Colloid Chemistry
CH 352	Introduction to Chemistry of High Polymers
CH 391	Industrial Chemistry
CH 365	Chemical Metallurgy
CH 481	Chemistry of Food and Nutrition
M 321, 322	Introduction to Statistical Theory

CHEMISTRY

(Textile Chemistry Major)

The Textile Chemistry curriculum is planned so as to give the student a thorough preparation in basic chemistry in addition to specialized instruction in textile chemstry. The particular areas of industrial employment of graduates include control work, production, research and development, sales and purchasing.

SOPHOMORE YEAR

First Semester				*Second Semester*			
CH 211	Quantitative Analysis	2 4 3		CH 212	Quantitative Analysis	2 4 3	
CH 231	Organic Chemistry	3 4 4		CH 232	Organic Chemistry	3 4 4	
M 201	Differential Calculus	3 0 3		M 202	Integral Calculus	3 0 3	
P 201	Physics II	3 2 4		P 202	Physics III	3 2 4	
CH 221	Intro. Text. Chem.	2 3 3		CH 222	Dyeing	2 3 3	
SS 220	Hist. of West. Civil.	3 0 3		SS 221	Hist. of West. Civil.	3 0 3	
			20				20

JUNIOR YEAR

CH 331	Adv. Organic Chemistry	3 4 4		CH 312	Instrumental Analysis	2 4 3	
CH 311	Instrumental Analysis	2 4 3		CH 321	Advanced Dyeing	2 2 3	
CH 313	Physical Chemistry	4 3 5		CH 342	Textile Printing	2 2 3	
CH 341	Textile Printing	2 3 3		CH 314	Physical Chemistry	4 3 5	
	Socio-Humanistic Elective	3 0 3		TE 306	Fabric Technology	2 0 2	
					Socio-Humanistic Elective	3 0 3	
			18				19

SENIOR YEAR

CH 421	Advanced Dyeing	2 3 3		CH 431	Chemistry of Fibers	3 2 4	
CH 451	Chem. Technology of Finishing	2 3 3		CH 442	Industrial Chemical Analysis	2 5 4	
CH 453	Microbiology	2 4 3		CH 452	Chemical Technology of Finishing	2 3 3	
TE 409	Microscopy and Testing	2 2 3		E 402	Effective Speaking	2 0 2	
E 401	Technical Report Writing	2 0 3			Socio-Humanistic Elective	3 0 3	
	Socio-Humanistic Elective	3 0 3					
			18				16

CHEMISTRY ELECTIVES

CH 351	Bacteriology
CH 352	Introduction to Chemistry of High Polymers
CH 391	Industrial Chemistry
CH 401	Colloid Chemistry
M 321,322	Introduction to Statistical Theory
CH 461	Organic Qualitative Analysis
CH 462	Organic Quantitative Analysis

ENGINEERING

The electrical and mechanical engineering curricula recognize the technical and social responsibilities that each graduate must accept on entering the engineering profession. The Technical goal of our engineering program is the preparation for the performance of the functions of analysis and creative design, or the function of production or operations; this requires a mastery of the fundamental scientific and mathematical principals associated with engineering. The social goal includes the development of leadership, the inculcation of a deep sense of professional ethics, and an understanding of the evolution of society and of the impact of technology on it.

First Semester

M	101	Algebra and Analytic Geometry	4	0	4
CH	111	Chemistry I	3	2	4
ME	111	Engineering Drawing	0	6	2
E	101	English Literature and Comp. I	3	0	3
SS	110	Psychology	3	0	3
					16

Second Semester

M	102	Calculus I	4	0	4
CH	112	Chemistry II	3	2	4
PE	211	Descriptive Geometry	2	3	3
E	102	English Literature and Comp. II	3	0	3
P	102	Physics I	3	2	4
					18

ELECTRICAL ENGINEERING

The expansion in the electrical engineering field continues at an explosive rate. Areas such as computation, guidance and control, and automation, which only yesterday were considered new are today a definite integral part of the field. In communications the advances have received good coverage so that the general public is quite aware of the strides being made. Consider, for example, television, space communications, and lasers. Among other technologies that are developing and having their impact in the electrical engineering field are thin-film, cryogenetics, bionics, and plasma dynamics.

In order to meet the challenge of the present and to be prepared to face the unpredictable future, the Electrical Engineering Department adopted a curriculum balanced between the mathematics and basic sciences, and the engineering sciences and professional subjects. The laboratory program, described in the course description section of this bulletin, is not course-oriented but emphasizes the inter-relationship of the various disciplines of engineering.

SOPHOMORE YEAR

First Semester				*Second Semester*			
M 201	Calculus II	4 0 4		M 202	Calculus III	4 0 4	
P 201	Physics II	3 2 4		P 202	Physics III	3 2 4	
ME 214	Mechanics Statics	3 0 3		M 310	Mechanics-Dynamics	3 0 3	
EE 202	Elements of EE	4 0 4		EE 207	Circuit Analysis I	4 0 4	
SS 221	History of Western Civilization	3 0 3		SS 230	Principles of Economics	3 0 3	
				EE 200	EE Laboratory I	0 3 1	
			18				19

JUNIOR YEAR

M 301	Calculus IV	3 0 3			Energy Conversion Devices	4 0 4	
EE 309	Circuit Analysis II	4 0 4		EE 310	Circuit Analysis III	3 0 3	
EE 304	Electronics I	3 0 3		EE 311	Electronics II	3 0 3	
EE 300	EE Laboratory II	0 6 2		EE 305	EE Laboratory III	0 6 2	
ME 319	Thermodynamics	3 0 3		EE 301	Fluid Mechanics	3 0 3	
	Humanities elective	3 0 3		ME 425	Humanities elective	3 0 3	
			18				18

SENIOR YEAR

EE 413	Feedback Control Theory I	3 0 3		EE 401	EE Laboratory V	4 0 4	
EE 409	Microwave Theory I	3 0 3			Technical Electives**	9 0 9	
EE 400	ME Laboratory IV	0 6 2		EE 402	Effective Speaking	2 0 2	
	Technical Elective**	3 0 3			Humanities elective	3 0 3	
EE 401	Technical Writing	2 0 3					
	Humanities elective	3 0 3					
			17				16

**APPROVED TECHNICAL ELECTIVES

First Semester			*Second Semester*		
EE	402	Intro. to Network Synthesis I	EE	403	Intro. to Network Synthesis II
EE	422	Intro. to Communication Theory I	EE	423	Intro. to Communication Theory II
EE	415	Advanced Electric Machinery	EE	410	Microwave Theory II
EE	424	Logic Circuit Design	EE	414	Feedback Control Theory II
ME	424	Vibrations	EE	416	Transistor Circuits
P	301	Modern Physics	EE	417	Physical Electronics
M	350	Fourier Series & Boundary Value Problems	EE	421	Power System Analysis
			EE	426	Digital & Analog Computers
			M	411	Complex Analysis

Total Credits: 140

MECHANICAL ENGINEERING

The profession of Mechanical Engineering extends into practically all branches of manufacturing and processing industries, as well as plant construction, power generation, and transportation.

In each industry there are several functions which the mechanical Engineer may perform. He may be assigned to general research and development involving such topics as experimental stress analysis, heat transfer in propulsion and guidance systems, exotic new metals and problems in miniaturization. He may be employed in the design of machinery for use in manufacturing processes and plants. He may be engaged in the construction of machinery and in the production of goods or with plant efficiency and problems of management. The mechanical engineer may find opportunities in sales engineering.

The Mechanical Engineering curriculum provides its students with a sound foundation in mathematics and science. It is designed to maintain a proper balance between the fundamental sciences, the socio-humanistic studies, and the basic engineering and technological subjects. Although there is little time for specialization, some flexibility is provided in the senior year by means of elective courses. A laboratory program supports the areas of materials, metallurgy, manufacturing processes, fluids, thermodynamics, and machine design.

Mechanical Engineering Program

SOPHOMORE YEAR

First Semester			*Second Semester*		
P 201	Physics II	3 2 4	P 202	Physics III	3 2 4
M 201	Calculus II	4 0 4	M 202	Calculus III	4 0 4
ME 214	Statics	3 0 3	ME 310	Dynamics	3 0 3
ME 201	Mfg. Processes	2 3 3	ME 202	Mfg. Processes	2 3 3
ME 212	Machine Drawing	0 6 2	SS 230	Princ. of Economics	3 0 3
SS 2221	Hist. of Western Civilization	3 0 3			17
		19			

JUNIOR YEAR

ME 320	Thermodynamics	3 0 3	ME 321	Thermodynamics	3 0 3
EE 303	Circuit Theory	3 2 4	EE 310	Electric Machinery	3 3 4
ME 314	Strength of Materials	4 0 4	ME 425	Fluid Mechanics	3 0 3
ME 316	Mechanisms	2 3 3	ME 219	Eng. Metallurgy	3 2 4
ME 314L	Mat'ls Laboratory	0 3 1	ME 326	Mech. Eng. Lab.	0 3 1
	Socio-Humanistic Elective	3 0 3		Socio-Humanistic Elective	3 0 3
		18			18

SENIOR YEAR

EE 419	Introductory Electronics	3 3 4	ME 424	Vibrations	3 0 3
			ME 420	Industrial Engineering	2 3 3
E 401	Report Writing	2 0 3	E 402	Effective Speech	2 0 2
ME 436	Heat Transfer	3 0 3	ME 422	Machine Design II	2 3 3
ME 421	Machine Design I	2 3 3		Technical Elective*	3 0 3
	Technical Elective*	3 0 3		Socio-Humanistic Elective	3 0 3
	Socio-Humanistic Elective	3 0 3	ME 426	Mech. Eng. Lab.	0 3 1
		19			18

*Elect one of the following:

ME 419	Tool Engineering	3	ME 428	Adv. Strength of Mat'ls	3
ME 435	Internal Combustion Engines	3	EE 420	Industrial Electronics	4
			ME 417	Advanced Kinematics	3
M 301	Calculus IV	3	EE 426	Digital & Analog Computers	3
EE 424	Logic Circuits Design	3			

MATHEMATICS

Bachelor of Science Degree in Mathematics

The Bachelor of Science program in mathematics is designed to give the student an appreciation of the role of mathematics in the modern world. Cognizant of its responsibilities to educate, the Department places the same emphasis on general education studies as it does on mathematics.

The mathematics major must accumulate a minimum of 42 semester hours in this special field, 36 semester hours in related fields and 42 semester hours in general education. A minimum of 120 semester hours is required for the degree.

The program is organized to enable the mathematics major to continue his graduate studies in either theoretical or applied mathematics. The student has the opportunity to become proficient in the theory and operation of computers which should serve him well in advanced study, industry, actuarial work or teaching.

The department also offers courses which meet the needs of students in science, engineering and business.

FRESHMAN YEAR

First Semester				*Second Semester*			
M 101	Algebra & Analytic Geometry	4 0 4		M 102	Calculus I	4 0 4	
CH 111	College Chem I	3 2 4		CH 112	College Chem II	3 2 4	
E 101	Eng. Comp. & Lit.	3 0 3		E 102	English Comp. & Lit.	3 0 3	
SS 110	Gen. Psychology	3 0 3		P 102	Physics I	3 2 4	
SS 220	History of Western Civilization	3 0 3		SS 221	History of Western Civilization II	3 0 3	
			17				18

SOPHOMORE YEAR

M 201	Calculus II	4 0 4		M 202	Calculus III	4 0 4	
M 223	Linear Algebra	3 0 3		M 225	Numerical Analysis	2 2 3	
P 201	Physics II	3 2 4		P 202	Physics III	3 2 4	
SS 240	Government	3 0 3		SS 230	Principles of Econ.	3 0 3	
L	Modern Language I	3 0 3		L	Modern Language II	3 0 3	
			17				17

JUNIOR YEAR

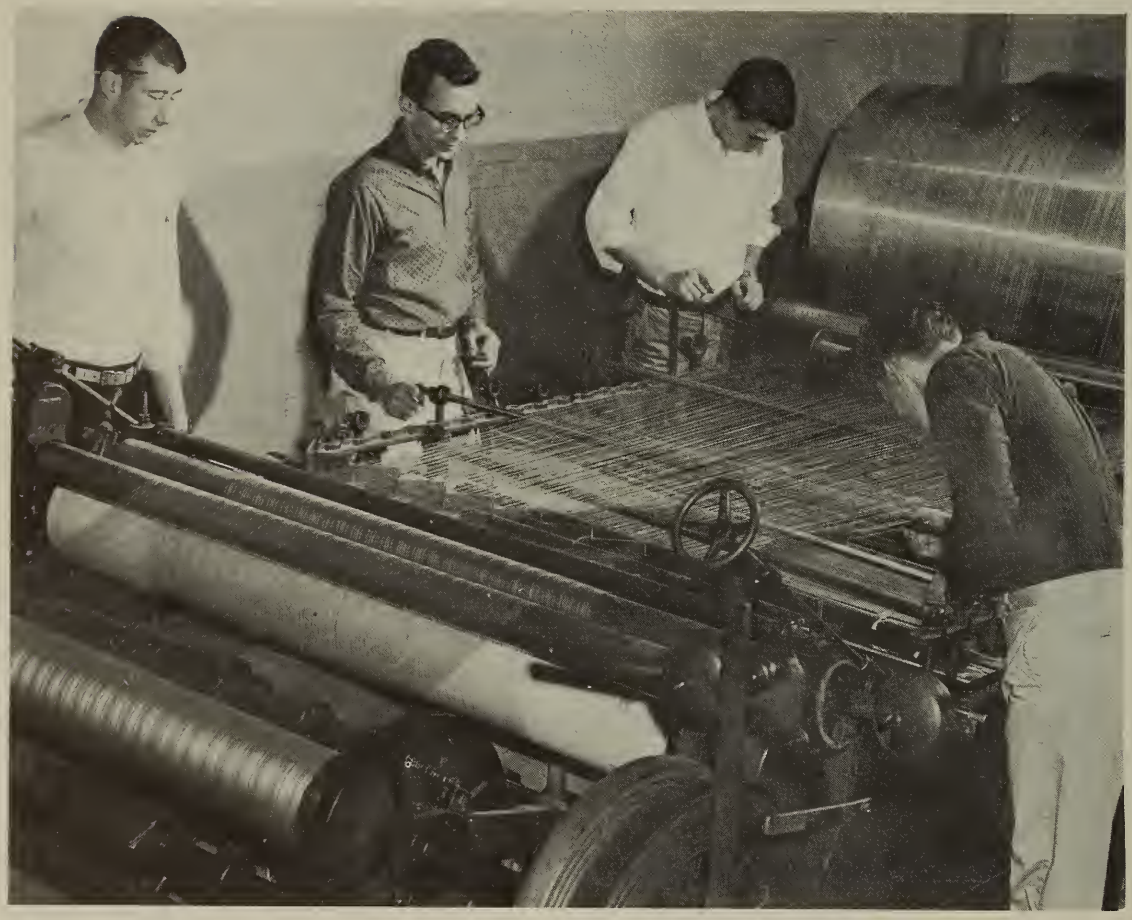
M 301	Calculus IV	3 0 3		M 332	Algebraic Structures	3 0 3	
M 321	Probability & Statistics	3 0 3		M 340	Linear Programming	2 2 3	
P 301	Modern Physics	3 0 3		EE 309	Circuit Analysis II	3 0 3	
EE 207	Circuit Analysis I	3 0 3		E 302	Major Writings in American Literature	3 0 3	
	Elective	3 0 3			Elective	3 0 3	
			15				15

SENIOR YEAR

M	430	Real Analysis I	3 0 3	M	401	Philosophy of Science	3 0 3
M		Major Elective	3 0 3	M	411	Complex Analysis I	3 0 3
E	401	Report Writing	3 0 3	M		Elective	3 0 3
		Elective	3 0 3	E	402	Effective Speaking	2 0 2
		Elective	3 0 3			Elective	3 0 3
			15				14

MATHEMATICS ELECTIVES

M	330	Intermediate Differential Equation	3 0 3
M	350	Fourier Series and Boundary Value Problems	3 0 3
M	431	Real Analysis II	3 0 3
M	333	Algebraic Structures II	3 0 3
M	360	Higher Geometry	3 0 3
M	250	Descriptive Astronomy	3 0 3
M	260	Celestial Navigation	3 0 3



TEXTILES

Because food, clothing and shelter are recognized as the three basic needs of man, the manufacture of textiles has become one of the world's leading industries. For this reason, the textile industry has so developed that it now ranks among the top five American industries in value of its product. It has been estimated that one-sixth of the total working population is employed in textile and allied industries.

Recent developments in new fibers, methods of processing, and dyeing and finishing technology have resulted in the need for specially trained men and women with a knowledge of the technology of textile processing and/or chemistry and engineering. Because the industry also recognizes the importance of a well-rounded education, it is felt that a knowledge of socio-humanistic studies, along with accounting and management will allow the textile graduate to meet more successfully the demands made of him.

Because of the size and diversity of textile and related industries, numerous opportunities are available for young men and women whose interests might lie in research, engineering, production, technology, sales, marketing, chemistry, design and fashion, and management. Starting salaries in the textile industry are comparable to those of any other major industry. Ambitious and alert college graduates will find excellent opportunities for advancement in these fields. A recent survey has shown that textile executives reach the top sooner and hold their jobs longer than any other industrial executive.

Two programs are offered, leading to the Bachelor of Science degree.

Textile Technology

The curriculum in Textile Technology is designed to prepare students to become competent textile technologists for eventual supervisory, administrative, or executive positions within the industry and related fields. This curriculum also provides a sound background for careers in sales and technical services. The main concern of this program is to acquaint the student with the theories and practical applications of yarn and fabric processing, fabric design and structure, determination of fiber and fabric strength and appearance characteristics, and the technology of dyeing and printing. The student is also acquainted with the properties, characteristics, uses, types, and availability of all textile fibers, natural or man-made. In the interest of a student's well balanced education, the academic courses in this program include an effective content of business management studies together with the recommended percentage of socio-humanistic studies as related to a program of engineering type education.

Design and Fashion

Modern advancements in textile technology point up a paramount need for a co-ordination of the special techniques of fabric and apparel designers. The styling, designing and development of fabrics and textures now require an expanded technical knowledge on the part of those concerned with the artistic and functional elements of textile materials.

The Textile Design and Fashion curriculum at the Institute offers the student instruction in design, drawing, painting and the history of art as the principal subjects during the Freshman year. The latter years are concerned with such courses as applied textile design, theories and practical studies in textile manufacturing, graphic arts and further studies in the history of art, drawing and painting. With the exception of the freshman year, projects are completed whereby students create and execute their own original fabric and apparel designs.

To give the student a well-balanced college education, courses in the socio-humanistic studies, such as English composition, psychology, history, economics and literature are included in the curriculum.

Design and Fashion Program

FRESHMAN YEAR

First Semester					*Second Semester*				
E	101	English Composition	3	3	E	102	English Composition	3	3
SS	230	Principles of Economics	3	3	SS	110	General Psychology	3	3
TD	107	Design	6	4	TD	108	Design	4	3
TD	101	Nature Drawing	3	2	TD	102	Nature Drawing	3	2
TD	103	Life Drawing	3	2	TD	104	Life Drawing	3	2
TD	105	Drawing & Painting	3	2	TD	106	Drawing & Painting	3	2
TD	111	Anatomy	2	1	TD	112	Lettering	2	1
TD	113	History of Art	2	2	TD	114	History of Art	2	2
TE	101	Intro. Survey of Textiles	1	1	TD	116	Projection Drawing	2	1
					TE	102	Fabric Classification	1	1
				20					20

SOPHOMORE YEAR

SS	220	Hist. of West. Civil.	3	3	SS	221	Hist. of West. Civil.	3 3
TE	208	Design and Structure	4	3	TE	209	Design and Structure	4 3
TE	206	Yarn Technology	1	1	TE	207	Fabric Technology	2 1
TD	203	Life Drawing	3	2	TD	204	Life Drawing	3 2
TD	201	Nature Drawing	3	2	TD	206	Drawing & Painting	3 2
TD	205	Drawing & Painting	3	2	TD	208	Textile Design	6 3
TD	207	Textile Design	4	2	TD	210	Fashion Illustration	2 1
CH	203	Introductory Dyeing	3	2	CH	204	Finishing Technology	2 2
TE	201	Fabric Testing	2	1				
				18				17

JUNIOR YEAR

TD	301	Textile Design	8	6	TD	302	Textile Design	8 6
TD	307	Handloom Weaving	4	2	TD	308	Handloom Weaving	4 2
TD	315	History of Costume	2	2	TD	316	History of Costume	2 2
TD	309	Apparel Design	4	3	TD	310	Apparel Design	4 3
TD	311	Fashion Illustration	3	2	TD	312	Fashion Illustration	3 2
		Socio-Humanistic Elective	3	3			Socio-Humanistic Elective	3 3
				18			Elective, Design or Fashion	2
								20

SENIOR YEAR

E	401	Technical Report Writing	2	3	E	402	Effective Speech	2 2
TD	403	Handloom Weaving	2	1	TD	404	Handloom Weaving	2 1
TD	401	Textile Design	6	4	TD	402	Textile Design	8 6
TD	409	Degree Project	4	2	TD	408	Apparel Design	4 3
TD	407	Apparel Design	4	3	TD	412	Fashion Illustration	4 3
TD	411	Fashion Illustration	4	3			Socio-Humanistic Elective	3 3
		Socio-Humanistic Elective	3	3				18
				19				

Textile Technology Program

FRESHMAN YEAR

First Semester						*Second Semester*				
E	101	English Composition	3	0	3	E	102	English Composition	3 0 3
SS	230	Principles of Economics	3	0	3	SS	110	General Psychology	3 0 3
BA	111	Accounting Principles	3	0	3	BA	112	Accounting Principles	3 0 3
ME	131	Engineering Drawing	0	3	1	M	112	Mathematics	3 0 3
M	111	Mathematics	3	0	3	ME	132	Engineering Drawing	0 3 1
CH	101	General Chemistry	3	2	4	CH	102	General Chemistry	3 2 4
					17	TE	100	Survey, Textile Technology	2 0 2
									19

SOPHOMORE YEAR

SS	220	History of Western Civilization	3	0	3	SS 221	History of Western Civilization	3 0 3
P	211	Physics	3	2	4	P 212	Physics	3 2 4
M	101	Mathematics	4	0	4	TE 201	Yarn Technology	2 2 3
TE	200	Yarn Technology	3	1	3	TE 203	Fabric Technology	3 2 3
TE	202	Fabric Technology	1	2	2	TE 205	Design & Structure	2 2 3
TE	204	Design & Structure	2	2	3	CH 292	Dyeing Technology	2 2 3
					19			19

JUNIOR YEAR

EE	313	Electric Circuits and Machines I	3	0	3	EE 314	Electric Circuits and Machines II	3 0 3
TE	300	Yarn Technology	2	2	3	TE 301	Yarn Technology	2 2 3
TE	302	Fabric Technology	2	3	3	TE 303	Fabric Technology	2 3 3
TE	304	Design & Structure	2	2	3	TE 305	Design & Structure	2 2 3
BA	307	Management Principles	3	0	3	BA 308	Management Principles	3 0 3
		Socio-Humanistic Elective	3	0	3		Socio-Humanistic Elective	3 0 3
					18			18

SENIOR YEAR

E	401	Technical Report Writing	2	0	3	E 402	Effective Speech	2 0 2
TE	406	Physical Testing	2	3	3	TE 407	Microscopy	2 3 3
TE	400	Yarn Technology	3	3	4	TE 401	Yarn Technology	0 3 2
TE	402	Fabric Technology	1	3	2	TE 403	Fabric Technology	1 3 2
TE	404	Knit Technology	2	1	2	TE 405	Knit Technology	2 1 2
M	311	Statistics	3	0	3	TE 408	Quality Control	3 0 3
		Socio-Humanistic Elective	3	0	3	CH 403	Fabric Finishing	2 0 2
					20		Socio-Humanistic Elective	3 0 3
								19

SOCIO-HUMANISTIC ELECTIVES

The course of study in each of the degree-granting departments provides the opportunity to elect a number of socio-humanistic and general courses. In this respect all students are required to include an elective in each semester of the Junior and Senior years. This program of courses is intended primarily to afford the student an opportunity to develop a broader acquaintance with personal, social, and cultural values. The student is required to elect 3 courses from Group A and the remaining elective from either group A or B according to his own interest and preference.

Group A (Socio-Humanistic Electives)

SOCIAL SCIENCES

SS	232	Economic Problems and Policies	3	0	3
SS	240	Government	3	0	3
SS	311	Psychology of Adjustment	3	0	3
SS	322	Economic History of the United States	3	0	3
SS	333	Economic Geography	3	0	3
SS	334	Contemporary Economic Issues	3	0	3
SS	341	Formation of American Foreign Policy	3	0	3
SS	423	History of American Civilization	3	0	3

LITERATURE

E	301	Masterpieces of World Literature	3	0	3
E	302	Major Writers in American Literature	3	0	3
E	311	Shakespeare	3	0	3
E	312	Modern Drama	3	0	3
E	321	Milton's Poetry and Selected Prose	3	0	3
E	322	Chaucer's Canterbury Tales	3	0	3
E	331	Walt Whitman and Henry James	3	0	3
E	332	Contemporary Poetry	3	0	3

Group B (General Electives)

M	250	Descriptive Astronomy	3	0	3
M	401	Philosophy of Science	3	0	3
BA	413	Labor-Management Relations	3	0	3
HU	301	Music Appreciation	3	0	3
HU	302	19th and 20th Century Art	3	0	3

NEW BEDFORD INSTITUTE OF TECHNOLOGY

The Graduate School

GENERAL INFORMATION

The New Bedford Institute of Technology has been authorized by Act of the General Court of the Commonwealth of Massachusetts to confer the degrees of Master of Science in Textile Technology and Master of Science in Textile Chemistry.

These graduate programs are designed to allow able students to further their studies in a specialized area not possible in the undergraduate curriculum. In addition to taking advanced courses in his field of special interest, a candidate is required to investigate a specific problem such as might be encouraged in a research laboratory or textile plant and, under competent guidance, to carry it through from start to finish; finally, the candidate is required to evaluate and interpret his findings in his Master's thesis. This experience is deemed excellent preparation toward a more advanced degree or a position of supervisory capacity in textile or allied industries.

Admission

Following are the admission requirements and conditions necessary for eligibility to the Graduate School:

The applicant must have received a Bachelor of Science degree in an appropriate field from an institution recognized by the Institute.

An average grade of "B" or better in the undergraduate major is required.

All graduate candidates must designate a major field; no unclassified students will be admitted to the Institute.

Admission will be to full graduate standing only. No provisional or special students will be admitted to graduate courses.

Application Procedure

A student interested in graduate studies at the Institute should file an application with the Director of the Graduate School. Applications may be obtained from the Business Office of the Institute.

Applicants should also:

File an application by the first of May preceding the fall term in which the applicant wishes to enroll.

Send directly to the Director of the Graduate School two letters of reference from persons qualified to judge the applicant's ability to carry on graduate work.

Have official transcripts of all undergraduate records (and graduate, if any) sent to the Director of the Graduate School by the institutions previously attended. The content, credit hours and semesters related to each subject taken must also be included. This information must be received at the Institute no later than the first of May preceding the fall term in which the applicant wishes to enroll.

Expenses

Tuition, fees and other expenses for graduate students are the same as those listed for undergraduate courses on page 17 of this bulletin.

Credits

A minimum of thirty semester credits is required by students for a graduate degree. Credits towards the Master of Science degree may be obtained as follows:

At least ten credits must be acquired from subjects designated as graduate courses.

Ten credits will be allowed for graduate or undergraduate courses relating to the particular major and must be approved by the head of the department of that field in which the degree will be granted.

All candidates for the graduate degree must prepare a thesis representing an original investigation. The thesis will represent ten credits.

No more than six credits will be accepted from other institutions.

At least twenty-four credits must be obtained through residence study.

Requirements for Graduation

In order to be granted the Master of Science degree the candidate must have fulfilled the following requirements:

Satisfactorily completed the prescribed course of study leading to the degree in the field in which the student has enrolled.

Have obtained a minimum of thirty credits; twenty credits obtained in the prescribed courses, of which fourteen are to be earned in the field of specialization and six in any other related field.

Satisfactorily completed a thesis covering original research and approved by the head of the department concerned.

All compiled data must be satisfactorily analyzed and interpreted.

Have passed a comprehensive oral examination to satisfy the examining committee that the candidate possesses a reasonable mastery of knowledge in his major and minor fields and that this knowledge can be used with promptness and accuracy. This examination will not be held until all other requirements, except completing the course work of the last semester, are satisfied. The examination, however, must be taken not later than two weeks before the end of the semester in which the degree is to be awarded.
Have maintained a minimum standing of "B" in both the graduate and undergraduate subjects studied.
A reading knowledge of at least one approved foreign language.

Have a minimum of one year of academic residence.
Have the approval of his graduate adviser in consultation with the department in which he is enrolled for all subjects studied.

Must complete all graduate work within two calendar years.

GRADUATE COURSES OF STUDY

The Institute offers curricula leading to the Master of Science degrees in Textile Chemistry and Textile Technology. The graduate courses offer the candidate considerable latitude in the particular area of specialization within the field. All candidates are, however, expected to have their choice of courses approved by their faculty advisor so as to provide a well-balanced over-all program to enable the successful candidate to adapt himself easily to industrial and graduate work.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

The Evening School

GENERAL INFORMATION

The Evening School is an integrated administrative unit of the New Bedford Institute of Technology. It is oriented to the need of supplying competently trained personnel to the professions and industries which the Institute serves. In addition, courses are offered to meet a growing need for the continuing education of the adult community.

The Evening School offers a wide range of courses in the fields of business administration, chemistry, engineering, and textiles. Courses in the socio-humanistic studies also are offered.

Special five-year programs are offered leading to associate degrees in business administration, electrical engineering technology, and mechanical engineering technology. Furthermore, courses on the graduate level are offered in several areas. The associate degree program at the Institute is a terminal program of instruction.

Entrance Requirements

Entrance requirements vary with the program or subject selected. Applicants for college credit are required to present qualifying high school records. For all non-credit programs, the only general requirement is the necessary professional or industrial experience. All applications must be reviewed by the department concerned prior to acceptance. Duly enrolled day school students may, with the permission of the Dean of Students, participate in the Evening School program.

Each applicant for the Associate Degree program must have earned a day high school diploma or its equivalency, and must have a minimum of one unit of algebra. It is further recommended that, if at all possible, the applicant show a background in the area of specialization. Each student will be interviewed by the department chairman for approval as a student in a particular program.

Registration

Registration forms may be procured in advance at the Business Office. Registration is normally held during the first week of September for the Fall term and during the second week of December for the Spring term. No new registrations will be accepted after the first two weeks of classes, except with the permission of the Director of Evening School and the instructor concerned. Students cannot apply for transfer to a college credit program after the first two weeks of classes.

Tuition and Fees

Tuition and Fees charged for attendance at the Evening School are as follows:

1. Non-credit courses are available without tuition charge to residents of New Bedford. (This is in lieu of a $10,000 annual grant to the Institute from the City of New Bedford.)
2. Non-credit courses have a tuition charge of $10.00 per course to non-residents of New Bedford.
3. A $9.00 per credit hour fee is charged to all students enrolled in a course for college credit. Out-of-state students will be charged $11.00 per credit hour if college credit is desired.
4. Audited credit courses have a tuition charge of $5.00 per credit hour.
5. The Five Year Associate Degree programs in Business Administration, Electrical Engineering Technology and Mechanical Engineering Technology have a tuition charge of $20.00 per semester.
6. A $2.00 laboratory fee is required of students enrolled in Chemistry and Machine Shop courses.
7. All fees are payable on, or prior to, the first week of scheduled classes.
8. No refunds for evening school classes will be made after two weeks from the date of initial class participation. An application for refund must be made by the student concerned; it is not the function of the Institute.

Attendance

Students must attend 85% of classes held and complete prescribed assignments in order to receive a certificate for the subject. Students in college credit courses must be present for 90% of the scheduled classes in addition to completing the prescribed assignments.

The academic year consists of two 15-week semesters in the Evening School. The first semester begins at the end of September and extends to the middle of January. The second semester begins during the last week of January and is completed about the middle of May.

The sessions per week and the semester(s) required to complete a subject are indicated in the evening school Bulletin. All lecture sessions are of 75 minutes duration and are conducted from 7:00 P.M. to 8:15 P.M., or 8:30 P.M. to 9:45 P.M. All laboratory classes are conducted from 7:00 to 9:45 P.M.

Courses of Study

Full information on credit and non-credit courses of study offered by the Evening School is outlined in a separate bulletin obtainable from the Business Office of the Institute or by addressing:

DIRECTOR OF EVENING SCHOOL
New Bedford Institute of Technology
Technology Center
New Bedford, Mass.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

Description of Courses

Course descriptions are arranged alphabetically by course numbers. Each number is composed of a code, which signifies the department offering the course, and a numerical value ranging anywhere between 100 and 499, inclusive. Courses bearing a number from 100 to 199, inclusive, are normally offered to freshmen; those from 200 to 299, sophomores; 300 to 399, juniors; 400 to 499, seniors. Follwing each curse number and title, the number of lecture recitations, laboratory hours and the total credit hours for a semester are given a numerical value. It will be found, however, that the lecture and laboratory hours are combined for all courses offered in the Textile Design and Fashion curriculum.

COURSE CODE TO DEPARTMENTS

Business Administration	BA
Electrical Engineering	EE
English and Modern Languages	E or L
Mathematics	M
Mechanical Engineering	ME
Physics	P
Social Science	SS
Textiles	
Design and Fashion	TD
Textile Technology	TE

Examples of the above coding systems are as follows:

P-102—*Engineering Physics*—(3-2-4). The letter "P" indicates the Department of Physics; "102" that the subject is offered in the Freshman year; (3-2-4) that three lecture recitations, two laboratory hours and four credits are given.

TE-300, 301—*Yarn Technology*—(2-2-3). This course in Yarn Technology has been given two course numbers indicating that it is taught for two semesters. The code "TE" represents the Department of Textile Engineering; "300, 301" shows that the course is normally offered in the Junior year; (2-2-3) means that two lecture hours, two laboratory hours and three credits are given for each semester.

DEPARTMENT OF BUSINESS ADMINISTRATION

BA 101—*Basic Accounting*—(Three lectures, one two-hour laboratory period each week; four credit hours). This course covers the basic principles and procedures in the development of the accounting cycle with emphasis on use of accounting knowledge as a fundamental aid to management and marketing.

BA 102—*Basic Accounting*—(Three lectures, one two-hour laboratory period each week; four credit hours). Introduction to partnership and corporation accounting. Consideration is given to the effects of automation in accounting procedures.
Prerequisite: BA 101.

BA 111, 112—*Accounting Principles*—(3-0-3 each semester). This course has been designed to give non-business administration students a general knowledge of accounting principles and techniques, and to acquaint them with the problems and methods involved in accounting for manufacturing costs. The course includes a presentation of the more important principles of cost accounting, taxation, budgeting, and the analysis and interpretation of financial statements.

BA 201—*Intermediate Accounting*—(3-0-3). Review of the nature and presentation of basic financial reports and records. A detailed analysis of profit and loss accounts and the effect on the balance sheet equation. Consideration of errors and corrections required by the most reputable standards in current professional practices.
Prerequisite: BA 102.

BA 202—*Advanced Accounting*—(3-0-3). A detailed study of procedures in partnership and corporation accounting. Installment and consignment sales, consolidations and fiduciary and budgetary accounting.
Prerequisite: BA 201.

BA 203, 204—*Effective Communication*—(3-0-3 each semester). The fundamental principles of effective writing with emphasis on clearness, conciseness, concreteness, character, and courtesy. Practical problems and practice in the preparation of inquiries and replies, notices, announcements, invitations, orders, acknowledgments, human-interest messages, the letter of application, effective sales letters and sales talks, adjustments, credit and collection letters, conference type discussions.
Prerequisite: E 102.

BA 205—*Marketing Principles*—(3-0-3 one semester). The study of the role of distribution in a dynamic economy. Social and economic value of marketing activities. Analysis of the processes and institutions involved in the distribution of commodities: product line selection, choice of wholesale and retail channels, advertising and determination of pricing strategy. Analysis of consumer demand through sampling techniques.

BA 206—*Marketing Management*—(3-0-3 one semester). An introduction to the nature and scope of marketing management. Emphasis is placed on decision-making through the use of case material. Special attention is given to the means by which marketing executives arrive at decisions in the areas of (1) product policy, (2) promotional policy, and (3) price policy.

BA 211, 212—*Managerial Accounting*—(3-0-3 each semester). A study of the effective uses and interpretation of financial data for non-accounting majors. Course content includes presentation and interpretation of financial statements, ratios, cash flow and application of funds, budgetary procedures, basic concepts of cost accounting.

Prerequisite: BA 102.

BA 301, 302—*Cost Accounting*—(3-0-3 each semester). A study of cost methods used in manufacturing, distribution and service operations. This course covers job order, process and standard cost systems. Cost of materials and labor including inventory and payroll records.

Prerequisite: BA 202 or 212.

BA 303—*Business Law*—(3-0-3). Study of legal principles and laws applicable to business. Courts and court procedures. Sales, insurance, contracts, agency, common carriers, partnerships. Text and case method are used.

BA 304—*Business Law*—(3-0-3). Laws pertinent to corporations, property sales, negotiable instruments and bankruptcy.

Prerequisite: BA 303.

BA 305, 306—*Advertising and Selling*—(3-0-3 each semester). A study of the principal forms of advertising. Practice in the planning of advertising and selling principles. Methods of selling and their application to specific cases with emphasis on sales management at both wholesale and retail levels.

BA 307, 308—*Management Principles*—(3-0-3 each semester). The study of the applications of basic economic principles to managerial decisions. A survey of the various techniques for planning, organizing, and controlling production. Case studies are used to provide familiarity with actual problems of production control, purchasing, location, physical facilities and personnel.

BA 309—*Insurance Fundamentals*—(3-0-3 first semester). The fundamental principles of insurance, economic and social aspects. A study of the most common forms of insurance: Life, property, casualty and suretyship. Visiting lecturers recognized as authoritative in each field.

BA 310—*Real Estate*—(3-0-3 second semester). An investment-oriented course. Study of the forms and types of properties and ownership, appraisal procedures, and financial arrangements. Guest lecturers.

BA 401, 402--*Auditing*—(3-0-3 each semester). Procedures and practices in auditing programs. Duties and responsibilities of an auditor. Preparation of audit working hours, financial statements and audit reports.
Prerequisite: BA 202.

BA 403—*Taxation*—(3-0-3). A course designed to acquaint the student with basic tax problems affecting the individual and the business organizations with which he may become associated. In addition to individual income taxes, sales and excise taxes as well as real and personal property taxation are treated.

BA 404—*Taxation*—(3-0-3). A study of the Internal Revenue Code as it affects individuals, partnerships, and corporations. Practical application through the preparation of tax returns for all types of taxpayers.
Prerequisite: BA 403.

BA 407, 408—*Market Research*—(3-0-3 each semester). A study of techniques of market research and principles applied to marketing problems. Field work and practice in making market surveys.

BA 409—*Business Policy Seminar*—(3-0-3). An analytic examination of the principles which govern the executives of a corporation in establishing the procedures and policies to be adopted in the operation of the business. A number of cases, taken from actual business situations, are analyzed with a view to developing the student's ability to determine the problems involved and to arrive at logical solutions based on reasoning and judgment.

BA 410—*Business Policy Seminar*—(3-0-3). A continuation of BA 409. In addition to participation in group discussion, students are required to submit a number of comprehensive reports on business situations presented to them.

BA 411—*Personnel Administration*—(3-0-3). Methods of recruiting, selecting and training personnel. Consideration of employee services, union-management relations, handling grievances, Cases and problems are utilized.

BA 412—*Business Fluctuations*—(3-0-3). Analysis of recurrent business fluctuations differentiating the typical business cycle and its phases. Treatment of the history, theories of causation and proposals for control of the business cycle.

BA 413, 414—*Labor-Management Relations*—(3-0-3 each semester). This course is designed to familiarize the student with problems in the field of labor-management relations, the approach of labor and management to these problems, the historic and economic background from which these problems have arisen, and government regulations in this field. Emphasis will be placed upon the following topics: The his-

tory of unionism in the United States, labor law and its enforcement, the structure and function of unions, collective bargaining, strikes, boycotts, lock-outs, and labor economics.

DEPARTMENT OF CHEMISTRY

CH 101, 102—*General Chemistry*—(3-2-4). An introductory course in Chemistry required for all students in the Textile Technology and theories, a general study of the common elements both metallic and curriculum. It comprises a general survey of Chemistry, its basic laws and theories, a general study of the common elements both metallic and non-metallic and a study of the use and application of chemistry to daily life. In the laboratory work which accompanies this course, the student performs experiments selected with a view to enabling him to learn to draw correct conclusions from definite happenings. It also enables him to acquire a certain manipulative technique in using the basic chemical tools.

CH 111—*General Chemistry*—(3-2-4)*, (3-2-5)†. This course is required of those students matriculating for the Bachelor of Science degree in Chemistry or Engineering. T he course comprises of a thorough

study of basic chemical facts: The study of matter, atomic structure and its applications to chemical reactions, the states of matter, solutions and equilibrium; the elements of Period III and their compounds are studied in greater detail in order to show more clearly the relation between atomic structure and chemical properties. The laboratory periods are designed to run concurrently with thel ectures.

CH 112—*General Chemistry*—(3-2-4)*, (3-0-3)†. A continuation of Ch. 111. Second Semester.

Prerequisite: Ch. 111.

Ch 113—*Qualitative Analysis*—(2-4-3). This course enables the student to tell what inorganic, and a few organic substances are present in a compound. The latest semi-micro technique of analysis is used. In the laboratory the student applies what he has studied in the analysis of both "known" and "unknown" materials. Problem work dealing with equilibrium and the other phases of qualitative analysis is stressed.

Prerequisite: Ch. 111.

Ch. 114—*Biological Science*—(3-0-3). A survey course in microbiology, predominantly the study of bacteria, which aims to show the importance of microorganisms to foods, sanitation and disease. Demonstrations are made of the simple techniques employed in the study of microorganisms.

Ch 115—*Biological Science*—(3-0-3). Nutrition and its place in the every day world. A course intended to aid the individual to understand the importance of food and nutrition in achieving and maintaining good health. Lectures and Demonstrations.

Ch 203—*Introductory Dyeing*—(1-2-2). A course especially designed for the Textile Design and Fashion students. Introduction to laboratory procedures. Preparation of cotton, rayon and synthetic fabrics for dyeing. Preparation and application of various dyes. Introduction to screen printing.

CH 204—*Finishing Technology*—(2-0-2). This course is arranged for the students enrolled in the Textile Design and Fashion Course. It deals with the application and end use of the various classes of textile finishes.

CH 211—*Quantitative Analysis*—(2-4-3). The lectures in this course comprise a thorough and complete discussion of the theories of solutions, a quantitative approach to oxidation-reduction reactions (redox reactions) and a study of some precipitation methods. The laboratory work is an application of the principles discussed in the lec-

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* For all engineering students.

† For all chemistry students.

tures. It consists of the calibration of the volumetric ware used and the analysis of materials by neutralization, oxidation-reduction and precipitation methods.

Prerequisite: Ch 113.

Ch 212—*Quantitative Analysis*—(2-4-3). This course is a continuation of Ch 211 and consists of a study of the gravimetric methods of analysis.

Prerequisite: Ch 211.

Ch 221—*Introductory Textile Chemistry*—(2-3-3). This course consists of a study of the physical and chemical constitution of the textile fibers, both natural and synthetic; a study of the physical and chemical changes that result from the action of various inorganic and organic agents on the fibers; a study of the methods of application and the effects of the various classes of dyes on the fibers.

Prerequisite: Ch 112.

Ch 222—*Dyeing*—(2-3-3). This course consists of a study of preparation of the textile fibers for dyeing; a study of the application of the various classes of dyestuffs to the textile fibers.

Prerequisite: Ch 221.

Ch 231, 232—*Organic Chemistry*—(3-4-4). A systematic study of the chemistry of the compounds of carbon as presented by the more prominent authorities in the organic field. Proper laboratory practice acquaints the student with the set-up of organic laboratory experiments and the synthesis, identification and proper handling of the compounds.

Prerequisite: Ch 113.

Ch 292—*Dyeing Technology*—(2-2-3). This course is designed to acquaint the student enrolled in Textile Technology with the fundamental properties of the several classes of dyes as related to their ability to color textile fibers and to acquaint him with terms and practices of their use in the industry.

Prerequisite: Ch 102.

Ch 311, 312—*Instrumental Analysis*—(2-4-3). This is primarily a laboratory course in which the student studies the analysis of various materials by means of analytical instruments. He studies the theory involved in the use of optical (colorimeters, abridged spectrophotometers, spectrophotometers) instruments, electrical (pH, potieniometry, electroanalysis) instruments and others. The laboratory work enables the student to make use of this theoretical knowledge in using the instruments.

Prerequisite: Ch 212, 232.

Ch 313, 314—*Physical Chemistry*—(4-3-5). A study of the fundamental laws and theories of chemistry and of the various factors which

modify and change the reactions and properties of chemical substances. The laboratory work is chosen to illustrate the principles studied. The problems given are a very important part of the course and quantitatively exemplify these principles.

Prerequisite: Ch 212, M 202, P 202.

Ch 321—*Advanced Dyeing*—(2-2-3). This course is taken concurrently with Ch 342 in order that the special attention necessary in preparing ground shade for discharge printing and the details of overdyeing resist printed fabrics may be better understood by the student. The theory of the selection of dyes for those purposes and the need for the addition of special chemical agents to the dye-baths is studied in detail.

Prerequisite: Ch 222.

Ch 331—*Advanced Organic Chemistry*—(3-4-4). The study of more complex organic compounds and reaction mechanisms, with emphasis being placed on dyestuffs and their intermediates.

Prerequisite: Ch 232.

Ch 332—*Advanced Organic Chemistry*—(3-4-4). Study of the laboratory practice of synthetic organic chemistry, with particular emphasis on the methods of isolating and purifying organic compounds.

Prerequisite: Ch 232.

Ch 341—*Textile Printing*—(2-3-3). In this course the student is introduced to the methods of textile printing (roller, screen, hand block, etc.) and the basic styles of printing (direct, discharge and resist). The preparation of print pastes for direct style printing of direct, basis, mordant insoluble azo, vat, leuco vat dyes, resin bonded pigments and oxidation colors is considered in detail, especially the complex chemical considerations of many of these print color preparations. All prepared color pastes are roller printed and the prints finished off by the students.

Ch 342—*Textile Printing*—(2-2-3). This course is taken concurrently with Ch 321. The more complex styles of printing, discharge and resist, are covered in detail. The preparation of white and colored print paste for all classes of dyed backgrounds is considered. A ll print pastes are screen printed.

Prerequisite: Ch 341.

Ch 351—*Bacteriology*—(2-4-3). An introductory course in bacteriology. The lectures present the fundamental concepts of this science and explains to the student bacterial classification and the significance of pathogenic and non-pathogenic micro-organisms. The laboratory work includes: preparation of culture media; sterilization of equipment and cultures; aseptic preparation and handling of pure cultures and simple and differential staining.

Prerequisite: Ch 112.

Ch 352—*Introduction to Chemistry of High Polymers*—(3-0-3). The chemistry of large molecular substances such as textile synthetics, resins and plastics.
Prerequisite: Ch 232.

Ch 360—*Chemical Literature*—(2-0-2). The course is designed to familiarize the student with the numerous journals and source books in chemistry. It requires a facility in reading German or French. The student will be expected to finish and hand in a report on some phase of chemical literature chosen by the instructor, before credit will be given.

Ch 365—*Chemical Metallurgy*—(2-0-2). A lecture course on the various processes of working metals and separating them from the ores.
Prerequisite: Ch 112.

Ch 391—*Industrial Chemistry*—(3-0-3). The student undertakes a detailed study of the more important chemical industries. Field trips to various plants will be arranged with a view to crystallizing what the student has learned and detailed reports will be expected.
Prerequisite: Ch 232.

Ch 401—*Colloid Chemistry*—(2-3-3). An introduction to the colloidal state of matter, covering a consideration of the characteristics and behavior of colloidal substance; methods of preparing colloidal substances; a study of natural colloidal substances and a special study of the application of colloidal behavior to the chemistry of textiles, dyeing and finishing.

Ch 403—*Fabric Finishing*—(2-0-2). A general course in fabric finishing designed for students not majoring in textile chemistry. Emphasis is placed on garment-type fabrics including stabilization finishes, water repellency, crease resistance and mildew proofing.

Ch 421—*Advanced Dyeing*—(2-3-3). The theory and practice of color matching are principally emphasized in this course. The student is taught the proper methods of obtaining a given shade by using a combination of several dyes. The testing of various classes of dyestuffs for their coloring powers and money value is included. The characteristics of the various dyestuff combinations are considered.

The more important AATCC tests procedures are also carried out.
Prerequisite: Ch 321.

Ch 431—*Chemistry of Textile Fibers*—(3-2-4). A course emphasizing: the relationship between the chemical structure and physical properties of fibers; the nature of the chemical reactions which produce degradation of fibers; the production of synthetic fibers. The short laboratory period is devoted to tests that serve to identify the types of fibers and their degradation products.
Prerequisite: Ch 232.

Ch 441—*Industrial Chemical Analysis*—(2-5-4). Analytical procedures used in industrial laboratories. Foods, fuel, water, oils, marine products, industrial chemicals. Laboratory work consists of the analysis of representative samples.

Ch 442—*Industrial Chemical Analysis*—(2-5-4). A continuation of Ch 441. Specialized procedures used in textile laboratories. Analyses include soap, fungicides, caustic, bleaching, solutions, water, chemicals, finishing compounds.
Prerequisite: Ch 312.

Ch 451—*Chemical Technology of Finishing*—(2-3-3). This course is restricted to students in the Textile Chemistry Course and deals with the application and end uses of the various classes of textile finishes and the procedures used in the application of these finishes to fabrics.
Prerequisite: Ch 321.

Ch 452—*Chemical Technology of Finishing*—(2-3-3). This course, a continuation of Ch 451, gives particular attention to special finishes, such as water repellent, fire retardant and crush resistant effects. This course is supplemented by field trips to various plants, bleacheries, dyehouses and textile printing plants.
Prerequisite: Ch 342.

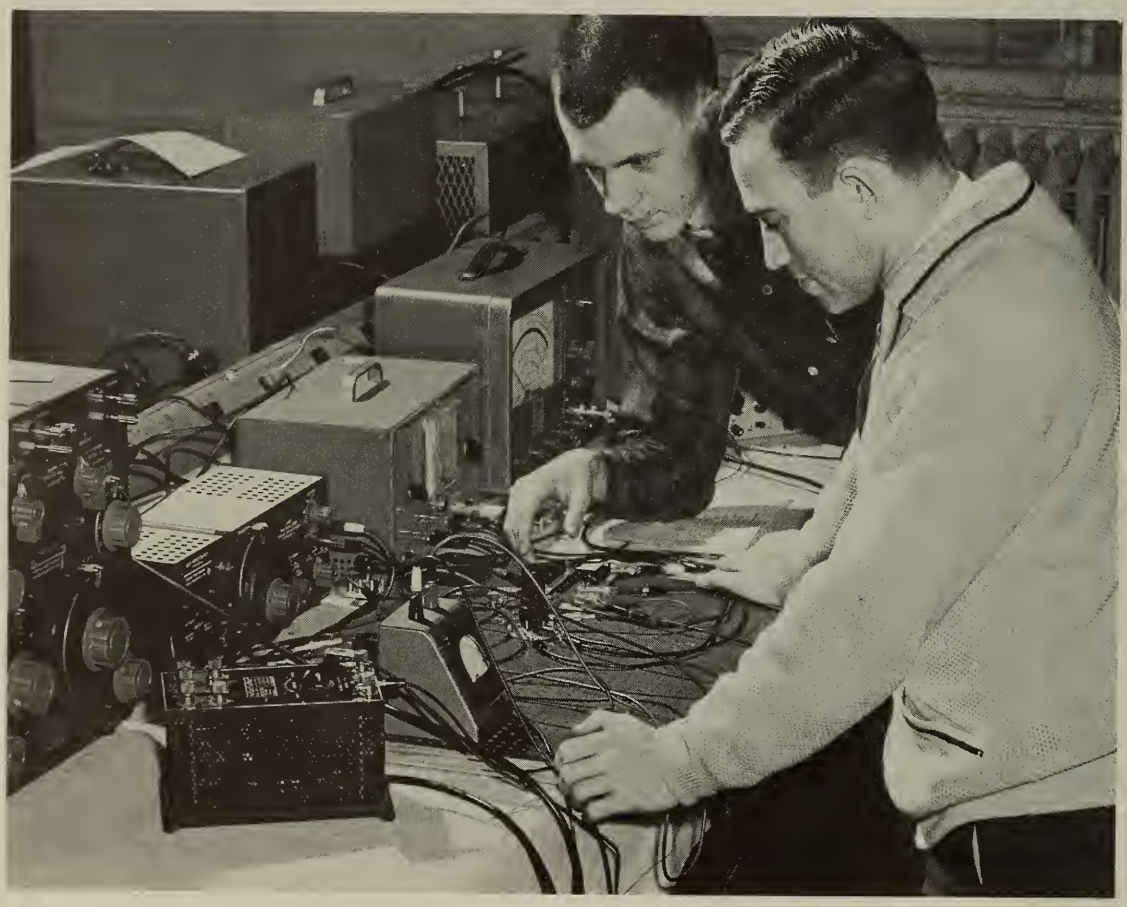
Ch 453—*Microbiology*—(2-4-3). This course includes the study of various micro-organisms and their importance to man and his textile world. Sterilization, disinfection, fumigation, staining, and methods of studying the action of molds and bacteria on textile fabrics are studied. Laboratory work includes the preparation and sterilization of the specific culture media, the staining and microscopic observation of the specific micro-organisms involved, and mildew and bactericidal tests on textile fabrics.
Prerequisite: Ch 351.

Ch 461—*Organic Micro-Quantitative Analysis*—(3-4-4). During the first semester the student determines, on a micro scale, carbon-hydrogen, nitrogen, halogen and other elements and groups commonly present in organic compounds. The lectures in this and the following course include a study of organic reaction mechanism from the point of view of steric and electronic effects.
Prerequisite: Ch 322.

Ch 462—*Organic Identification* (3-4-4). In the second semester the student applies standard methods of identification of organic compounds to a number of unknowns in the laboratory and covers, in addition to the principles involved in the application of these methods, the Beilstein method of classification of compounds, the systematic solution of identification problems and further study of reaction mechanisms.
Prerequisite: Ch 461.

Ch 465, 466—*Thesis* ADQ. *A thesis covering the experimental and* literature investigation of some approved subject is optional for outstanding senior chemistry majors.

Ch 481—*The Chemistry of Food and Nutrition*—(3-0-3). Composition of foods. Vitamins, proteins, fats, carbohydrates, minerals. Analytical methods used in food analysis.
Prerequisite: Ch 212.



DESCRIPTION OF COURSES

Department of Electrical Engineering

Laboratory Course Descriptions

A five semester sectional laboratory course is provided to develop an ability for engineering investigation of electrical equipment in general. Recognition and understanding of limitations of performance of common equipment found in the field forms an important basis. In addition students acquire a knowledge of the techniques of electrical measurement and analytical report writing. The laboratory course is distinct from the lecture courses in Electrical Engineering. Each section of the course provides a sequence of experiments, progressively requiring an increase in scientific background. Experiments are carefully selected to allow the most complete coverage of general course material, based upon the order of lecture material completed. In addition, provision is made in the senior year for the development of individual student projects of an investiga-

tive or research nature, requiring a summation of previously acquired techniques of approach for solution.

EE 200—*EE Laboratory I*—(0-3-1). This section of the laboratory course is primarily an indoctrination into the techniques of electrical measurements. Experiments lead to development of ability to construct standard instrument and test circuitry. Recording and reporting procedure is included for the measurement of voltage, current, power, resistance, inductance and capacitance. Indoctrination into the correct procedures for producing a short and formal laboratory written report is an essential part of this section.

EE 300—*EE Laboratory II*—(0-6-2). This section of the laboratory course continues with the application of measurement techniques to circuit investigative procedures. An ability to test circuitry for unknown factors, defects, and suitability is developed. Circuits for the testing and operating of D.C. and A.C. electrical machinery and controls are set up. Performance characteristics and limitations of operation are reported in further development of report writing ability. Completion of EE-200 or equivalent work is a prerequisite for entry into this section.

EE 301—*EE Laboratory III*—(0-6-2). This section of the laboratory course introduces the student to electronics measurement techniques. Performance characteristics of vacuum tubes and semi-conductor devices form the basis of most experiments. Elementary electronic circuits are tested for characteristic performance. Report writing techniques are further developed in this section. Completion of EE-200, or equivalent work, is a prerequisite for entry into this section.

EE 400—*EE Laboratory IV*—(0-6-2). This section of the laboratory course continues with experiments in advanced electronic circuits. Filters, Modulators, Demodulators, Multivibrators, and computation circuits are made the subject of experiments. Elementary principles of feedback and servo-mechanisms, also form the basis of some experiments. Completion of EE-200 and 301, or equivalent work, is a prerequisite for entry into this section.

EE 401—*EE Laboratory V*—(0-6-2). The final section of undergraduate laboratory work continues with more advanced experiments in servo-mechanisms, microwaves, and electronic equipment and devices. Experiments requiring research and analysis of commercially available electronic equipment are conducted. Students are encouraged to develop individual plans of investigation or research under the guidance of faculty recommendations. Completion of laboratory program through EE 400, or equivalent work, is a prerequisite for entry into this section.

EE 202—*Elements of Electrical Engineering*—(4-0-4). Fundamentals of electrical engineering including electrostatics, magnetostatics, and structure and behavior of semi-conductors, the dielectric processes, the magnetic processes and optical processes.

Prerequisite: M 201 taken concurrently.

EE 207—*Circuit Analysis I*—(4-0-4). Course includes such topics as the following: network topology; network theorems—loop currents, nodal voltages, superposition. Thevenin's and Norton's theorems; maximum power transfer; duality; energy storage in electric circuits; initial conditions; introductory a.c. and poly-phase circuitry.
Prerequisite: M 201.

EE 303—*Circuit Theory*—(3-2-4). Includes circuit theory of d.c. and sinusoidal quantities, application of network theorems, polyphase circuits and an introduction to electrical measurements. Problem sessions and laboratory accompany regular assignments.
Prerequisites: M 202. Not open to EE majors.

EE 304—*Electronics I*—(3-0-3). Basic principles of electronics including electron ballistics and semi-conductor action; study of vacuum tubes and transistors. Laplace transformation (S-domain) methods are employed in the study of basic circuits and examples.
Prerequisite: E 309.

EE 305—*Electronics II*—(3-0-3) (Formerly EE 405). Course includes a study of the application of vacuum tubes and semi-conductor devices to perform specific functions in communication systems including modulation, amplification, and oscillation; and factors affecting frequency response; input and output impedances.
Prerequisites: EE 304.

EE 309—*Circuit Analysis II*—(4-0-4). Topics to be studied include impulse response, convolution, Fourier Series and Fourier Integral, Laplace Transformation, pole and zero configurations and their interpretation. Matrix notation will also be covered.
Prerequisites: EE 207 (M 202 desirable).

EE 310—*Energy Conversion Devices*—(3-0-3). Basis of electromechanics as applied to energy conversion devices is introduced early in the course. This is followed by studies of specific devices such as dynamos and other transducers including transformers. Mathematical models of typical physical devices are discussed. (Mechanical engineering students have accompanying laboratory session. (3-3-4)).
Prerequisite: EE2 07 or EE 303.

EE 311—*Circuit Analysis III*—(3-0-3). A continuation of EE 309 to include a study of circuit response by Fourier and Laplace transform methods, and Foster and Cauer networks, two-terminal-pair ladder networks, constant -k filters, m-derixved filters and lattice and composite filters. Signal-flow graph analysis also is covered.
Prerequisite: EE 309.

EE 313—*Electric Circuits and Machines I*—(3-0-3). Course offered to textile majors emphasizing operating principles rather than de-

tailed mathematical theory. Topics include basic d.c. circuits, electromagnetic principles d.c. generators and motors, and motor control. Introduction to a.c. circuits.
Prerequisite: M 102.

EE 314—*Electric Circuits and Machines II*—(3-0-3). Continuation of EE 313 including basic single-phase circuits, three-phase circuits, transformers, a.c. generators and motors, and motor control. Introduction to electronics.
Prerequisite: EE 313.

EE 402—*Introduction to Network Synthesis I*—(3-0-3) Formerly EE 412. This course presents the fundamental concepts of network synthesis including such topics as physical realizability of 1-port and 2-port networks, Foster and Cauer forms, and maximally- flat filter functions. Senior elective.
Prerequisite: EE 309 (EE 311 desirable).

EE 403—*Introduction to Network Synthesis II*—(3-0-3). Continuation of EE 402, covering some of the recent advances in the field including methods and topics such as those developed by Darlington, Brune, Guillemin, Ono, and Bott-Duffin.
Prerequisite: EE 402.

EE 409—*Microwave Theory I*—(3-0-3) Formerly EE 411 Engineering Electromagnetics An analytical approach to static and time-varying fields. Included are such topics as Divergence Theorem, Poisson and Laplace equations, boundary-value problems; wave propagation along transmission lines, use of the Smith Chart.
Prerequisite: M 202 (M 301 desirable).

EE 410—*Microwave Theory II*—(3-0-3) Continuation of EE 409. Course includes high frequency circuit concepts, TE and TM waves, waveguides, generation of microwaves, and basic microwave measurements.
Prerequisite: EE 409.

EE 413—*Feedback Control Theory I*—(3-0-3). This first course will comprise of a review of modern operational methods as applied to closed-loop feedback systems, determination of roots of polynomials, electrical analogs, signal-flow diagrams, Routh's criterion, Nyquist criterion. root-locus methods, and Bode diagrams.
Prerequisite: EE 309 (EE 311 desirable).

EE 414—*Feedback Control Theory II*—(3-0-3). Continuation of EE 413 including compensation techniques employing methods of analysis developed in first course. An introduction to sampled-date and non-linear systems will also be considered.
Prerequisite: EE 413.

EE 415 — *Advanced Electric Machinery* — (3-0-3). Generalized analysis of machines used for energy control and conversion using matrix transformations etc. Application of methods of analysis to systems containing electric machines.
Prerequisite: EE 310, M 202.

EE 416—*Transistor Circuits*—(3-0-3). Course covers the basic methods of transistor circuit analysis and design including biasing, study of various models for transistor circuits, noise considerations, and some transistor applications.
Prerequisite: EE 305.

EE 417—*Physical Electronics*—(3-0-3). Senior elective course intended to enhance the student's fundamental understanding of the physical aspects of electronics. Included are such topics as free-electron theory, atomic bonding, quantum mechanics, electron emission, semi-conductor materials and devices, plasma and breakdown mechanisms, etc.
Prerequisite: EE 202 (or P 201) and M 202.

EE 419—*Electronics*—(3-3-4). A course for non-electrical engineering majors consisting of a study of basic eletron circuit components and electron tubes. Performance of vacuum tubes as rectifiers, amplifiers, oscillators and relays. Laboratory sessions included.
Prerequisite: EE 303.

EE 420—*Industrial Electronics*—(3-3-4). Study of vacuum tube applications to industrial control. Performance of electronic controls in instrumentation, regulation and relaying. Functions and limitations of commercial electronic control devices including metadyne control principles and photoelectric relays. Laboratory sessions accompany this course.
Prerequisite: EE 419.

EE 421—*Electric Power Systems*—(3-0-3). Power system parameters, steady-state calculations, fault calculations and transients stability. Theory of symmetrical components with application to the operation of electric power systems under unbalanced and steady-state conditions, components of instantaneous currents and voltages and their use in transient problem. Characteristic of synchronous plants.
Prerequisite: EE 310.

EE 422—*Introduction to Communication Theory I*—(3-0-3). This course will discuss the mathematical representation of non-random and random signals including Fourier transforms, sampling theorems, modulation theory, probalilistic concepts, random processes, power spectral density. Senior elective.
Prerequisite: EE 309 (and/or M202).

EE 423—*Introduction to Communication Theory II*—(3-0-3). Continuation to EE 422 including the study of basic information theory,

random noise, signal-to-noise ratio, decision concepts, likelihood ratio, and selected topics.

Prerequisite: EE 422.

EE 424—*Logic Circuit Design*—(3-0-3) Boolean algebra. Simplification and minimization methods of switching circuits; sequential circuits, pulsed sequental circuits. Discussion of some special digital computing circuits including counters, differentiating and integrating circuits and others.

Prerequisite: EE 304 or EE 419 desirable.

EE 425—*Wave Forming Circuits*—(3-0-3). Theory and design of generators and shapers of non-sinusoidal waves including clampers, clippers, stretchers, selecting circuits, limiters, peakers and ringing circuits.

Prerequisite: EE 304 and EE 311.

EE 426—*Digital and Analog Computers*—(3-0-3). Introductory course to digital and analog computer methods. Topics covered include digital counters, storage devices, input devices, and an introduction to digital computer programming; analog adders, integrators, multipliers, function generators, scale factors. Use of the institute's computer facilities to solve illustrative examples form part of the course. Senior engineering elective.

DEPARTMENT OF ENGLISH AND MODERN LANGUAGES

E 101—*English Composition*—(3-0-3). In the first semester, the aim of the course is to introduce the student to the principal uses of language. Emphasis is placed on the ability to write clearly. The fundamentals of grammar, sentence structure, punctuation, paragraph structure, proper organization of materials and problems of style are considered. In addition, attention is given to the problem of straight and logical thinking, with frequent writing exercises and supplementary readings.

E 102—*English Composition and Introduction to Literature*—(3-0-3). In the second semester, the student is introduced to imaginative literature and literary theory. The aim is to guide the student through a series of reading experiences illustrating that novelists, poets, and playwrights say important things about human life; in addition, emphasis is Placed on techniques of literary communication and differences between literary art and other forms of discourse. Frequent exercises in writing will be required for review of principles of composition.

E 301—*Masterpieces of World Literature*—(3-0-3). The course covers a study of selected classics from the Golden Age of Greece to the Twentieth Century. Emphasis is placed upon some of the fundamental ideas and literary forms that are an important part of the heritage of Western Civilization.

E 302—*Major Writers in American Literature*—(3-0-3). A survey of selected American writers from the Colonial Period to the present. Emphasis is placed upon the development of characteristic literary forms and upon ideas important in the evolution of American thought.

E 311—*Shakespeare*—(3-0-3). (Offered, Fall Semester, 1963-64). The course is concerned with the careful reading of from ten to twelve of Shakespeare's plays selected from the histories, comedies, and tragedies. The plays are read with Shakespeare's Elizabethan background in mind, and emphasis is on an understanding of Shakespeare's skill as a dramatist, his artistry as a poet, the universality of his appeal, and the reasons for his place as the greatest writer in the English language. Some outside reading will be required in Shakespearean criticism and in the history of the period.

E 312—*Modern Drama*—(3-0-3. (Offered, Fall Semester, 1964-65). The course is designed to acquaint the student with works of important modern dramatists from Ibsen and Chekov through such near-contemporaries or contemporaries as Shaw, Fry, Anouilh, Giraudoux, T. S. Eliot, Arthur Miller, and Tennessee Williams. Emphasis is placed on the changes and developments in dramatic technique that have occurred in recent years. In addition, there is emphasis on the place of the theater as a medium through which men have constantly explored the meaning of the world around them.

E 321—*Milton's Poetry and Selected Prose*—(3-0-3). (Offered, Spring Semester, 1964-65). A study of Milton's poetic achievement based on the reading of selected minor poems and their developmental relationship to *Paradise Lost, Paradise Regained,* and *Samson Agonistes.* Selected prose pamphlets are read either in their entirety or in selection to demonstrate the developmnt of th mind of Milton as a writer of the Renaissance.

E 322—Chaucer's *Canterbury Tales*—(3-0-3). (Offered, Spring Semester, 1964-65). A study of Chaucer as a literary artist based on the careful reading and critical discussion of the complete text of *The Canterbury Tales.* This work is developed not only to demonstrate its permanent value as literature, but also to relate its significance to the understanding of the society of Chaucer's time.

E 331—*Walt Whitman and Henry James*—(3-0-3). A critical analysis of two of America's greatest and yet most widely-maligned and praised literary figures. Both of these writers are approached with relation to their expression of an American consciousness. In each case, emphasis is placed on form, style, content, and literary technique. In addition to Whitman's *Leaves of Grass,* the following prose writings are studied: Prefaces to the 1855, 1872, and 1876 editions; *A Backward Glance O'er Travel'd Roads;* and selections from *Democratic Vistas.* James is represented by two novels—*The American* and *The Ambas-*

sadors—and also selected short stories illustrating the development of his style and literary craftsmanship.

E-332—*Contemporary Poetry*—An analysis of selected writings of contemporary poets, designed to introduce the student to such poets as T. S. Eliot, Robert Frost, Dylan Thomas, Gerard Manley Hopkins, Marianne Moore, Ogden Nash, Robert Bly, George Oppen and others. Emphasis is placed on developing an understanding and appreciation of the imagery, thought, universal appeal and artistic language of the representative poems.

E 401—*Report Writing*—(2-0-3). The approach to report writing is a flexible one; that is, the course is concerned with basic principles relating to structure, organization, and effective communication. No attempt is made to establish standardized forms in report writing. A substantial report based on individual research among literary sources is required at the end of the semester.

E 402—*Effective Speaking*—(2-0-2). The course attempts to cover the theory and practice of speaking to both professional and lay groups. Various speaking situations are studied and participated in. The course includes considerable attention to and evaluation of the individual problems of each student.

L 201, 202—*French I, II*—(3-0-3). A course in the fundamentals of the French language. Grammar, composition, and reading of French prose.

L 211, 212—*German I, II*—(3-0-3). An elementary course in the German language. Covers grammar, composition, and reading of German prose.

L 301—*French III*—(3-0-3). A survey course of French literature of the Middle Ages and Renaissance. Conducted in French.
Prerequisite: L 202 or consent of the department head.

L 302—*French IV*—(3-0-3). Surveys literature of the Classical Period to 1850. Conducted in French.
Prerequisite: L 301 or consent of the department head.

L 303—*French V*—(3-0-3). Reading and writing of French scientific and technical material and the acquisition of an extensive scientific vocabulary. This course may be substituted for L 302.
Prerequisites: L 201, L 202 or consent of the department head.

L 313—*German III*—(3-0-3). Reading and writing of German scientific and technical material and the acquisition of an extensive scientific vocabulary. This course may be substituted for L 315.
Prerequisites: L 211, L 212 or consent of the department head.

HU 301—*Music Appreciation*—(3-0-3). A general course to enable the student to listen to music intelligently and to develop a higher degree of enjoyment to music listening. Includes definition and demonstration of basic elements of music, its forms and style, and a discussion of composers of each general segment of music history. Extensive use is made of recordings and the piano in the lectures.

L 314—*German IV*—(3-0-3). A survey of German literature of the nineteenth century. Conducted primarily in German.
Prerequisites: L 211, L 212 or consent of the department head.

L 315—*German V*—(3-0-3). Surveys German literature of the twentieth century. Conducted primarily in German.
Prerequisite: L 314 or consent of the department head.

DEPARTMENT OF MATHEMATICS AND PHYSICS

Bachelor of Science in Mathematics Degree

M-101—*Algebra and Analytic Geometry*—(4-0-4). A rapid review of algebraic functions; equations, identities, and inequalities. Plane analytical geometry with emphasis on the straight line, circle, and conics. Determinants, elements of solid analytic geometry and graphs of transcendental functions.

M-102—*Calculus I*—(4-0-4). After a preliminary discussion of limits, continuity, the derivatives and the validation of theorems pertaining to these concepts, all the derivatives of elementary functions are developed

and applied along with pertinent theorems. The integral concept is introduced early in the course and the various techniques of anti-differentiation, including the methods of partial fractions and integration by parts, are developed and used.
Prerequisite: M-101.

M-111—*Math I*—(3-0-3). The elements of algebra. This course is intended primarily for students with only one entrance unit of algebra. The course continues, after a thorough review of the fundamentals of algebra, with function, determinants, complex numbers, quadratic equations and inequalities.

M-112—*Math II*—(3-0-3). This course consists of a study of the laws of logarithms and their use, exponential equations, the logarithmic and exponential curves, power functions and their graphs, parabolic and hyperbolic type curves, logarithmic plotting, trigonometric functions of angles with liberal table work, vector applications of trigonometry, concise treatment of reduction formulae, trigonometric formulae and identities, trigonometric equations, complex numbers and fundamental theorems relating to polynomial equations.
Prerequisite: M-111.

M-201—*Calculus II*—(4-0-4). This course is a continuation and amplification of the methods and techniques of the M-102. It also embraces and extensive study of the theory and applications of integration methods in both rectangular and polar coordinates. Limits and sequences are considered along with a thorough treatment of infinite series. Multiple integration and an introduction to linear systems, partial differentiation and differential equations complete the course.
Prerequisite: M-102.

M-202—*Calculus III* (Differential Equations)—(4-0-4). This course embraces a study of ordinary and partial differential equations of the first and higher orders with special emphasis placed on application to mechanical and electrical systems. The solutions to some non-linear equations are treated. Additional topics included in the course are: methods of Taylor and Picard, Frobenius solutions, Numerical solutions, Boundary-Value problems, Fourier Series and the Laplace Transformation including the convolution Theorem.
Prerequisite: M-201.

M-212—*Mathematics of Finance*—(3-0-3). This course covers the basic mathematics essential to an understanding of financial computations. The following mathematical principles and applications are studied: simple and compound interest, annuities, depreciation, valuation of bonds and insurance, taxes—property and personal, partial payment, discounts, wage payments, installment buying, sinking funds.
Prerequisite: M-112.

M-223—*Linear Algebra*—(3-0-3). This course is designed primarily for students majoring in the physical sciences and engineering. It deals principally with linear algebra, matrices and quadratic forms and constitutes a background for advanced courses such as abstract algebra, mechanics and mathematical statistics. Topics included in the course are: vectors and vector spaces, matrices, linear transformations in a vector space, reduction of quadratic forms, vector spaces over the complex field.
Prerequisite: M-102.

M-225—*Numerical Analysis*—(3-0-3). Introduction to the theory and practice of the solution of equations, interpolation, numerical differentiation and integration, and the numerical solution of ordinary and partial differential equations. Additional topics from the following: summation of series, least-squares methods, Chebyshev approximation, harmonic analysis, approximation by exponential functions and by rational functions, determination of characteristic numbers of matrices.
Prerequisite: M-201.

M-250—*Descriptive Astronomy*—(3-0-3). This course will cover the classical and philosophical topics of astronomy, e.g., time, cosmology, the origin of the solar system. An introductory study of the solar, stellar and galactic systems will be made. The more prominent constellations and brighter stars will be studied and observed. Evening classes will be held to supplement the course with celestial observations using the institute telescope.

M-260—*Navigation*—(3-0-3). This course deals with the basic concepts of navigation and the application of these concepts to dead reckoning and radio navigation. The principles and techniques of celestial navigation will be discussed and developed. Celestial observations will afford the student an opportunity to practice the techniques of modern celestial navigation.
Prerequisite: M-101.

M-301—*Calculus IV* (Advanced Calculus)—(3-0-3). This course begins with an exposition and validation of the basic techniques of vector analysis with ample applications to mechanics, hydrodynamics and electromagnetism. Bessel and Legendre functions are treated along with Fourier-Bessel and Legendre series and the Fourier Integral. The latter part of the course deals with a study of the partial differential equations of mathematical physics and their solutions and an introduction to the functions of a complex variable, including analytic functions.
Prerequisite: M-202.

M-311—*Statistics I*—(3-0-3). A course to acquaint the student with the basic concepts in statistics. A study is made of the meaning of statistics, the collection of statistical data, tabular presentation, ratios, percentages, bar charts, line charts, statistical maps, pi-charts, basic concepts of frequency distribution, histograms, frequency polygons and the

Lorenz curve. A laboratory period is included to allow time for a comprehensive term project.
Prerequisite: M-112.

M-312—*Statistics II*—(3-0-3). A continuation of M-311 including the arithmetic mean, median, mode, dispersion, skewness, quartile, deviation, standard deviation, kurtosis, moments of a distribution correlation, time series analysis—including the secular trend, the seasonal fluctuation, cycles and forecasting. A project on business research is conducted by the class.
Prerequisite: M-311.

M-313—*Theory of Equations*—(3-0-3). This course offers a full and explicit development of complex numbers, polynomials in one variable, algebraic equations and their roots, rational roots, cubic and biquadratic equations, separation of roots, the theorem of Sturm, approximate evaluation of roots, determinants and matrices, solution of linear equations by determinants, some applications of determinants to geometry, symmetric functions and elimination.
Prerequisite: M-201.

M-321—*Introduction to Statistical Theory I*—(3-0-3). A first course in statistics intended to present to the student the logical foundations and universality of inferential statistics. A brief treatment of traditional descriptive statistics serves as a prelude to a mathematcal probabilistic approach to the concept of a distribution function and an intensive study of the normal frequency distribution and its first and second moments.
Prerequisite: M-101.

M-322—*Introduction to Statistical Theory II*—(3-0-3). A continuation of M-321 dealing with curve fitting, simple correlation, sampling and reliability, testing of hypotheses, and multiple and partial correlation.
Prerequisite: M-321.

M-330—*Intermediate Differential Equations*—(3-0-3). This course deals with the solutions of first order non-linear differential equations, second order linear differential equations with variable coefficients, Cauchy polygons and successive approximations, series solutions, special functions, asymptotic behavior and numerical methods.
Prerequisite: M-201.

M-332—*Algebraic Structures I*—(3-0-3). The basic concepts of groups, sub-groups, factor groups, rings and the real and complex fields; homomorphism theorems, factorization theory for Euclidean rings, vector spaces and elementary field theory.
Prerequisite: M-201.

M-333—*Algebraic Structures II*—(3-0-3). Applications to vector spaces and linear algebra, polynomials, cyclic groups, theory of matrices and determinants, tensor and Grassman algebras.
Prerequisite: M-332.

M-340—*Linear Programming*—(2-2-3). Origin of linear programming problems, Simplex and other methods of computation, operations with matrices, sets and determinants; linear vector spaces; characteristic value problems; theory of games.
Prerequisite: M-223 or Engineering Seniors.

M-341—*Computer Seminar*—(3-0-3). This seminar is designed to give the student a brief background on the history and development of the modern computer. The characteristics of the digital computer and its application to analysis and control will be discussed and demonstrated in the New Bedford Institute of Technology Computer Center. Topics in modern computer development, as e.g., i. Development of Building Blocks, ii. Numerical techniques, iii. Development of Associated Peripheral Equipments, will be studied.

This course is open to engineering seniors and to special students on approval of the department.

M-350—*Fourier Series and Boundary Value Problems*—(3-0-3). Theory of Fourier series and integrals as developed along modern lines. Stress upon solution of boundary value problems by Fourier series, Bessel function, Legendre polynomials.
Prerequisite: M-202.

M-360—*Higher Geometry*—(3-0-3). Plane and space curves, first and second differential forms of a surface; Theorems of Meusnier and Euler; lines of curvature, asymptotic lines, conjugate lines, geodesics. Theorems of Gauss and Codazzi developable surfaces, surfaces of rotation, Liouville surfaces, differential parameters and problems of mapping.
Prerequisite: M-202.

M-401—*Philosophy of Science I*—(3-0-3). A survey course designed to expose the students of science and engineering to the principles that underlie the mathematical and physical sciences and the human processes that seek to justify their formulation. Several problems that arise in science are met and discussed; e.g., Relativity, the Uncertainty Principle and Free Will, Causality, etc. The inadequacies of scientific formulations and espistemological problems such as the inductive method, statistical inference and the relation between sense deliverances and the real world are considered.
Prerequisite: M-202.

M-411—*Complex Analysis I*—(3-0-3). This course deals with the elementary theory of complex analytic functions which include the Cauchy

Riemann differential equations, contour integration, conformal mapping, calculus of residues and the Taylor and Laurent series.
Prerequisite: M-301.

M-430—*Real Analysis I*—(3-0-3). This course deals with the study of real numbers and Euclidean n-space; the Cauchy condition; infinite series of real numbers, tests of convergence, power series; real valued functions; continuity, uniform continuity, bounded variation; Riemann-Stieltjes integration, infinite series of functions uniform convergence, differentiation and integration of seres of functions.
Prerequisite: M-202.

M-431—*Real Analysis II*—(3-0-3). The course continues with Taylor's theorem, Weierstrass' approximation theorem, Fourier series; orthogonal functions, Bessel's inequality; Jacobian and inverse function theorems, implicit function theorem, functional dependence; change of variables in multiple integrals, line and surface integrals; Stokes, Green's, and divergence theorems.
Prerequisite: M-430.

P-102—*Physics I*—(3-2-4). A study of Mechanics dealing with Kinetics, statics, elasticity, hydrostatics, hydrodynamics and mechanics of gases. Laboratory consists of measurements related to above topics.
Prerequisite: M-101.

P-201—*Physics II*—(3-2-4). A course study in Electricity and Magnetism dealing with the fundamental laws of electric and magnetic fields, electrostatic fields, potential, steady-state currents, induced emf's inductance, dielectrices, capacitance, and elementary transients. Laboratory consists of measurements related to the above topics.
Prerequisite: P-102.

P-202—*Physics III*—(3-2-4). A study of Heat dealing with temperature, calorimetry, change of state, heat transfer, thermal properties of matter, elementary thermodynamics. Wave motion, vibrating bodies, acoustical phenomena, geometrical optics, reflection, refraction, mirrors and lenses are also studied. Laboratory consists of measurements related to the above topics.
Prerequisite: P-201.

P-211—*College Physics I*—(3-2-4). This course is designed for students not majoring in engineering. The general subjects to be covered in the first semester are mechanics and heat. Demonstrations of physical principles are incorporated into lecture periods and the laboratory schedule follows closely the material covered in the lectures.

P-212—*College Physics II*—(3-2-4). This course follows the same general development and laboratory program as P 211. The subjects covered in this course are sound, light and electricity and magnetism.
Prerequisites: P-211.

P-301—*Modern Physics*—(3-0-3). An introduction to modern physics including atomic and nuclear physics, spectroscopy, photoelectric phenomenon, solid, state physics, wave mechanisms and X-ray crystallography.
Prerequisite: P-202.

DEPARTMENT OF MECHANICAL ENGINEERING

ME 111—*Engineering Drawing*—(0-6-2). A course which provides a background of freehand lettering, orthographic projections, instrumental and freehand execution of auxiliary, isometric, oblique and sectional drawings. Blueprint reading, threads, fasteners and principles of dimensioning are stressed to prepare the student to read and write in the language of the practicing engineer.

ME 127—*Theory of Projection*—(0-2-1). An orientation course in the field of orthographic projection to develop skill in the use of drawing instruments and the ability to visualize and prepare three dimensional drawings.

ME 131, 132—*Engineering Drawing*—(0-3-1) (0-3-1). A course for textile technology students. The content is similar to that of ME 111.

ME 201—*Manufacturing Processes*—(2-3-3). A study of processes and equipment envolved in machining materials. Included are turning machines, boring, milling, grinding, and thread cutting. T he laboratory provides instruction in the use of the basic machine tools of industry.

Emphasis is placed on the capabilities and limitations of the machines. Various operations involving the use of the engine lathe, drilling, and polishing machines are also included.
Prerequisite: Simultaneous registration in ME 212.

ME 202—*Manufacturing Processes*—(2-3-3). A continuation of ME 201, covering gears and gear manufacturing, casting, hot and cold working processes, welding, and allied processes. The laboratory continues with instruction in machining processes with inclusion of operations involving the use of the milling machine and heat treating techniques.
Prerequisite: ME 201.

ME 211—*Descriptive Geometry*—(2-3-3). A course that integrates the theory and practice of descriptive geometry as applied to engineering problems in the field. The course covers topics on point line and space relations, intersections, perpendicularity, mining and civil engineering problems, revolutions, vectors, tangencies, development, conics, map projection and spherical triangles.
Prerequisite: ME 111.

ME 212—*Machine Drawing*—(0-6-2). This course is concerned with teaching the engineering student to be able to prepare detail and assembly working drawings of machines and elements. Topics covered are dimensioning gears, cams, welding drawings, charts and graphs. A practical project is assigned to groups for analysis and development for manufacture.
Prerequisite: ME 111.

ME 214—*Engineering Mechanics (Statics)*—(3-0-3). An introductory course in mechanics dealing with the statics of particles—forces in a plane and space; statics of rigid bodies in two and three dimensions; equivalent systems of forces and equilibrium of rigid bodies; analysis of structures; trusses, frames, and machines; friction; distributed forces; moments of inertia—areas.
Prerequisite: P 102.

ME 219—*Engineering Metallurgy*—(3-2-4). The course presents the fundamentals of metal structure, factors affecting engineering properties, static, and dynamic properties of metallic materials, corrosion and extraction of metals from their ores. Also includes a study of phase diagrams and simple alloy systems, heat treatment, light alloys, and construction of steel. Supplemented by a series of laboratory assignments.
Prerequisite: CH 112.

ME 310—*Engineering Mechanics (Dynamics)*—(3-0-3). An introduction to the kinematics and kinetics of particles, force, mass and acceleration, work and energy, and impulse and momentum. Deals also with the kinematics and the kinetics of rigid bodies, dynamic equil-

ibrium, work and energy, impulse and momentum and mechanical vibrations.

Prerequisite: ME 214.

ME 313—*Strength of Materials*—(3-2-4). A course for students in Electrical engineering curricula supplemented with approximately seven experiments in the materials testing laboratory. Emphasizes the fundamental principles. Considers concentric loading emphasizing stress and an introduction to Mohr's circle; torsional loading of circular cross sections, flexural loading, statically indeterminate beams, combined loading, columns, repeated loading and dynamic loading.

Prerequisite: ME 214.

ME 314—*Strength of Materials*—(4-0-4). A study dealing with elementary stresses and strains, stresses due to change in temperature, combined stresses, torsion, shear and moment in beams, deflections in beams, beams of two materials, statically indeterminate beams, columns and strain energy applications.

Prerequisite: ME 214.

ME 314—*L Strength of Materials Laboratory*—(0-3-1). A series of laboratory experiments designed to illustrate the properties of engineering materials, and some of the methods for their testing.

Prerequisite: With ME 314, or following.

ME 315—*Strength of Materials*—(3-0-3). A continuation of ME 314 including statically indeterminate beams, theories of elastic failure, curved bars, strain-energy applications, combined stress analysis, and thick walled cylinders.

Prerequisite: ME 314.

ME 316—*Mechanisms*—(2-3-3). A study of the relative motions of machine parts. Operating principles are analyzed to determine displacement, velocity, and acceleration by analytical and graphical methods. Emphasis is placed upon linkages, cams, rolling contact, gearing, flexible connectors, gear trains, translation screws, and dimensional systhesis.

Prerequisite: ME 212.

ME 319—*Thermodynamics*—(3-0-3). A course presented to non-mechanical engineering majors in elementary thermodynamics. Areas of study include properties of substances, first law of thermodynamics, the ideal gas, the gas turbine, liquids and vapors, heat exchangers, steam turbines and the reversed cycle.

Prerequisites: M 202 and P 202.

ME 320—*Thermodynamics*—(3-0-3). A course presenting the fundamental concepts of thermodynamics for the engineering majors. The course includes a study of the first law of thermodynamics, the general energy equation, properties of the common working substances, the second law of thermodynamics, analysis of cycles and internal combustion engines.

Prerequisites: M 202 and P 202.

ME 321—*Thermodynamics*—(3-0-3). A continuation of ME 320, this course includes a study of vapors, Mollier diagrams, vapor cycles, steam power plants refrigeration and heat transfer.
Prerequisite: ME 320.

ME 326—*Mechanical Engineering Laboratory*—(0-3-1). A series of experiments for students in Mechanical Engineering including solid and liquid fuels, combustion products, lubricants. Measurement of steam flow and steam properties.

ME 417—*Advanced Kinematics*—(3-0-3). This course includes a study of type, number, and dimensional synthesis; mechanical computing mechanisms and the geometry of constrained motion. Topics dealing with linkage design and special purpose mechanisms are also covered.
Prerequisite: ME 316.

ME 419—*Tool Design*—(2-2-3). Lecture and laboratory work for the purpose of providing Mechanical Engineering students with a survey of the Tool Design Field. Detailed discussions of the principles and practices of tool design are carried on in lectures; their practical applications being carried out during the laboratory sessions.
Prerequisites: ME 202 and ME 212.

ME 420—*Industrial Engineering*—(2-3-3). Designed to teach a practicable method whereby full advantage can be taken of all the different interconnected modern techniques by which a satisfactory and workable layout can be developed. Modern mass production methods and the major problem of the essential coordination between plant layout, material handling, methods engineering, production planning, and control are discussed. A project is assigned to students for the purpose of providing practice in application of the above techniques.
Prerequisite: Senior standing.

ME 421—*Machine Design I*—(2-3-3). A course designed to furnish work in the fundamentals of machine design. The design point of view is developed and the student is gradually encouraged to make design decisions after due consideration of the factors involved. Lecture and laboratory periods are devoted to the major areas of simple stress analysis, tolerances and allowances, variable loads and stress concentrations, screw fastenings and springs.
Prerequisite: ME 314.

ME 422—*Machine Design II*—(2-3-3). Theory and problems involving both analysis and design of machine parts used in the construction of modern machines. Some of the topics studied are: combined stresses, shaft design by the analytical and graphic methods, lubrication of plain surface and journal bearings, ball and roller bearing selections, keys and couplings, gear design, and gear train analysis.
Prerequisite: ME 421.

ME 424—*Vibrations*—(3-0-3). The basic theory of mechanical vibrations. Such topics as simple harmonic motion, single degree of freedom systems with and without damping, forced vibrations, vibration absorbers, critical speed in shafting, and dynamic balancing are among those studied.

Prerequisite: M 301.

ME-425—*Fluid Mechanics*—(3-0-3). Fluid statics, fluid dynamics, ideal and viscous fluids, boundary layer, losses in systems, compressible and incompressible fluids, flow around immersed objects, lift and drag, are among topics studied.

Prerequisite: ME 320.

ME 426—*Mechanical Engineering Laboratory*—(0-3-1). A laboratory course for senior students in Mechanical Engineering. Selected experiments in strain measurements, heat power, fluid mechanics, and properties of engineering materials.

ME 428—*Advanced Strength of Materials*—(3-0-3). Selected topics such as theories of elastic failure, unsymmetrical bending, curved flexural members, thick walled cylinders, localized stress concentrations are among those covered in this course.

Prerequisite: ME 314.

ME 435—*Internal Combustion Engineers*—(3-0-3). A study of the internal combustion engine processes including the air-standard cycle analysis, engine cycles, deviation of real engines from ideal engines. Also includes study of detonation and knock testing, carburation and fuel injection, combustion chamber and cylinder head design, engine lubrication, cooling and performance. Supplemented by visual aids and laboratory assignments.

Prerequisite: ME 321.

ME 436—*Heat Transfer*—(3-0-3). Steady and unsteady state conduction; free and forced convection; radiant heat transmission. Emphasis on fundamentals and application of these fundamentals in the solution of heat transfer problems and the design of heat transfer equipment.

Prerequisite: ME 321.

DEPARTMENT OF SOCIAL SCIENCES

SS 110—*General Psychology*—(3-0-3). This course is designed to introduce the student to psychology through a study of growth and development, motivation, frustration, emotion and feeling, learning, attention and perception, intelligence, thinking and personality.

SS 220—*History of Western Civilization I*—(3-0-3). This course introduces the student to the main stream of our Western-cultural heritage. It traces the history of man from earliest times to the Age of

Louis XIV. While political history serves as a framework, emphasis is placed on the social, intellectual and economic factors of our past.

SS 221—*History of Western Civilization II* (3-0-3). This course continues the History of Western Europe from 1715 to the present. Emphasis is again placed on the political, social, intellectual and economic factors which contributed to the development of our Western-European-cultural heritage.

SS 230—*Principles of Economics*—(3-0-3). A survey of basic economic principles to include: the structure of the American economy, production, exchange, valuation, distribution, consumption, saving and investment. Topical consideration will be given to: capitalism in our economy, business organization, money, credit, banking, gross national product, personal income distribution, business cycles, genesis of value and price, price determination and demand and supply. (This course is not open to Business Administration Majors).

SS 231—*Economic Analysis, Problems and Policies I*—(3-0-3). An introductory study inclined toward macroanalysis of the American economy. Stress is upon national income, production, employment, economic growth, economic fluctuations, monetary and fiscal policy, the price system and the allocation of resources. (This course is required for Business Administration Majors).

SS 232—*Economic Analysis, Problems and Policies II*—(3-0-3). A continuation of course SS 231 with emphasis on problems and policies. The study will include micro and macro aspects of money, monetary policy, economic stability, economic growth and policy goals, income distribution, the public economy, and comparative economic systems. (Required for Business Administration Majors).

Prerequisite: SS 230 or 231.

Elective.

SS 240—*Government*—(3-0-3). This course will consider the theory and practice of American National Government with a view to the relations among the three branches: executive, legislative and judicial. An emphasis will be placed upon the development of governmental practices and responsibilities and the resulting problems thereof arising from the democratic nature of the modern industrial society and the international position of the United States.

SS 311—*Psychology of Adjustment*—(3-0-3). A study of the dynamics of human adjustment. Attention will be directed toward an examination of motivation, frustration, conflict, types of adjustment, anxiety, the role of learning in adjustment, psychotherapy and mental hygiene.

Prerequisite: SS 110, Junior standing.

Elective.

SS 322—*Economic History of the United States*—(3-0-3). A study of the major developments in the American economy from the

Colonial Period to the present time. The course treats of the influence of the frontier, the influx of immigrants, the growth of technological knowledge, the evolution of business organizations, government regulation and control, the growth of the machine process and of business enterprise. Emphasis will be placed on case studies of selected business enterprises leading to the evolution of public policy. (Required for Business Administration Majors).

Prerequisite: SS 221.

Elective.

SS 333—*Economic Geography*—(3-0-3). A study of the regional distribution of the world's resources, industries and population. Emphasis is on the distribution and importance of manufacturing, mining, forestry, agriculture, trade in relation to the factors of power resources, raw materials, climate, landforms, centers of population and world trade markets. This course provides an essential background for understanding industrial and commercial opportunities and limitations in various areas of the world.

Elective.

SS 334—*Contemporary Economic Issues*—(3-0-3). An analysis of current economic issues and their effects upon national economic conditions. Emphasis is on developing the student's ability to apply economic principles to problems of our economy with analysis of policy criteria. Issues to be studied include: "core" problems in agriculture, gold reserves, competition and monopoly, inequality of income distribution, protectionism and free trade, taxation, and causes and effects of inflation and deflation.

Prerequisite: SS 230 or 231, Junior standing.

Elective.

SS 341—*Formation of American Foreign Policy*—(3-0-3). This course will deal with the development of the American diplomatic policy from the Revolutionary War to the present. Emphasis will be placed on the integral relationship of foreign and domestic policies, including the problems resulting from the democratic nature and theory of American political experience, and key decisions and decision-makers of the United States foreign policy.

Prerequisite: SS221, Junior standing.

Elective.

SS 350—*Sociology*—(3-0-3). An introduction to the study of society. The course treats of the factors in the social life of man, the role of culture, group life, crowds and publics, status and social class, population distribution and growth, social institutions and social change.

Prerequisite: SS 110, Junior standing.

Elective.

SS 412—*Industrial Psychology*—(3-0-3). This course deals with the principles of psychology as applied to business and industry. Topics

to be studied are: individual differences, morale, job satisfaction, supervision, communication, industrial conflict, accidents, interviewing and psychological testing in business and industry.

Prerequisite: SS 110, Junior standing.

Elective.

SS 423—*History of American Civilization*—(3-0-3). This course traces the history of our unique American Civilization from its founding to the present time. Emphasis is placed on cultural developments in the United States; political and economic developments, however, are not ignored. Stress is placed on such diverse topics as our European heritage, foundations of the new nation, division and integration (1820-1876), industrialization of American life and the triumph of democracy in America.

Prerequisite: SS 221, Junior standing.

Elective.

DEPARTMENT OF TEXTILES

Division of Design and Fashion

TD 101, 102—*Nature Drawing*—(3-2). A beginning study in the structures, patterns and colors found in nature. The student draws and paints actual specimens, studying the forms and textures in detail.

TD 103, 104—*Life Drawing*—(3-2). The study of the human figure, its form, mass and proportions, with emphasis on movement. A

course in anatomy assists the student in the study of form and structure of the human body.

TD 105, 106—*Drawing and Painting*—(3-2). An introductory course to explore the capacity of paint and other media to symbolize the sensory images of sight and touch and translate these symbols into pictorial composition. The first semester is devoted to the study of the language, principles and traditional concepts of picture making.

TD 107, 108—*Design*—(6-3). Problems in two and three dimensional design involving color, line, form, texture and spatial relationships, give the student a basic knowledge for future courses in further design.

TD 111, 112—*Anatomy*—(1-1). A study of the bones of the skeleton, the muscles, and complete construction of the human figure. This is the basis of life drawing, fashion illustration and fashion design.

TD 113, 114—*Introduction to Art History*—(2-2). An investigation of man's creative efforts in the visual arts at selected moments in history, to evaluate the meaning of art of the past and its value for us today (that is, the various kinds of information it gives us, including that on taste and style). Visits to art museums are included in the course.

TD 116—*Projection Drawing*—(2-1). This course provides a basic understanding of the methods used by engineers, designers and illustrators to describe the size, shape or the layout of an object.

TD 201—*Nature Drawing*—(3-2). More detailed study of natural forms, using watercolors, tempera and scratchboard. The student is made aware of the vast inspirational material to be found in plants and other natural objects.
Prerequisites: TD 101, 102.

TD 203, 204—*Life Drawing*—(3-2). An advanced study of the human figure. Study includes exploration in color of the draped figure.
Prerequisites: TD 103, 104.

TD 205, 206—*Drawing and Painting*—(3-2). An expansion of the introductory course designed to increase the appreciation of the fundamental restrictions of the picture plane and the painter's tools. Further study of composition is carried on to stimulate individual expression.
Prerequisites: TD 105, 106.

TD 207, 208—*Textile Design*—(4-2) (6-3). This course begins with practice in rendering techniques to study the elements involved in designing printed and woven materials. Experiments in color and pattern and printing processes acquaint the student with the fundamentals of designing fabrics.

TD 210—*Fashion Illustration*—(2-1). An introduction to fashion illustrators, and concentration on the development of the fashion figure.

TD 301, 302—*Textile Design*—(8-6). Theoretical problems in fabric design and printing are keyed to industrial production for a variety of uses. Students develop original designs and learn to carry them to completion as printed goods by using the silk screen process.
Prerequisites: TD 208, 109.

TD 307, 308—*Handloom Weaving*—(4-2). This course gives the student the opportunity to learn the basic principles of hand weaving, and to experiment with colors and textures suitable for application to the power loom. He is encouraged to design directly on the loom, and to use a variety of available materials.

TD 309, 310—*Apparel Design*—(4-3). Lectures on fashion design theory and the fashion industry are followed by the construction and use of a basic pattern, which are the first steps to originating an idea and conceiving it in the drafting class.

TD 311, 312—*Fashion Illustration*—(3-2). The course includes the study of layouts and advertising, and the development of rendering and techniques necessary for reproduction purposes.
Prerequisite: TD 210.

TD 315, 316—*History of Costume*—(2-2). A survey of clothing development from earliest times to the present day. The utilization of source material from libraries, museums, etc. and the application of ideas from this research contributes to original designs.

TD 401, 402—*Textile Design*—(6-4) (8-6). More advanced problems in designing, and experiments in production techniques using the silk screen process are encountered during the last year. In the final semester individual problems are carried out, and a portfolio is compiled.
Prerequisites: TD 301, 302.

TD 403, 404—*Handloom Weaving*—(2-1). The advanced course gives the student an opportunity to develop some original designs which can be produced on a hand loom. The designs are then illustrated in the form of paintings.
Prerequisites: TD 307, 308.

TD 407, 408—*Apparel Design*—(4-3). Further study of advanced methods of pattern drafting and draping.
Prerequisites: TD 309, 310.

TD 409—*Degree Project*—(4-2). In the senior year each student selects a specific part of the textile design and fashion field and completes a required amount of creative work and research. This project is submitted for approval before graduation.

TD 411, 412—*Fashion Illustration*—(4-3). A further study of rendering and layouts. Drawing from live models serves as a discipline for observing details and the fall of fabrics on the human figure. During

the second semester the student completes a series of fashion drawings to be used in his portfolio.

Prerequisites: TD 311, 312.

TD 440—*Advanced Design Elective*—(3-2). A course, open to juniors and seniors, in which the student explores several different media. He is encouraged to do independent research and must complete several original projects in the course of the semester.

Division of Textile Engineering

TE 100—*Introductory Textile Technology*—(2-0-2). A course designed for the purpose of indoctrinating Freshmen of the Textile Technology course in the non-technical phases of the textile industry. It gives the student an elementary understanding of the origin, types and uses of textile fibers. The course also provides a general discussion of the machinery involved in processing these fibers into yarn and fabrics. The theory and application of the yarn numbering systems are also discussed.

TE 101—*Introductory Survey of Textiles*—(1-0-1). An introductory course designed to familiarize the student of the Textile Design and Fashion course with the elementary and non-technical phases of the textile industry. A study is made of the definitions of the common terms used in manufacturing and finishing of textiles. The properties and characteristics of the natural and man-made fibers as well as the use of flow-charts for processing these fibers into a finished product are also reviewed.

TE 102—*Fabric Classification*—(1-0-1). A course relating to the characteristics, performance, properties and uses of a wide range of staple fabrics. Special emphasis placed upon the manner of producing various textures in woven fabrics, incorporating both natural and man-made fiber content.

Prerequisite: TE 101.

TE 200—(3-1-3). TE 201—(2-2-3). *Yarn Technology.* The earlier lectures and laboratory periods of this course are devoted to the history, development, classification, ginning and marketing of cotton. Following this brief introduction, the lectures are devoted to the theory of processing, both natural and man-made fibers into sliver; this is coupled with the mechanics and application of the equipment involved. Comparative studies are made of opening and cleaning systems with special emphasis being placed on the statistics of blending, evening and the attenuation of fibers. All speed and production calculations that are associated with the mechanisms are also considered.

TE 202—(1-2-2). TE 203—(3-2-3). *Fabric Technology.* Courses of study in the fundamentals and principles of the mechanisms related to the fabrication of materials by the process of weaving. Cam operation is basic in this introduction phase. Theory of motions for the shedding,

picking, beat-up, let-off, and take-up principles are also basic. Progress follows into the study of the dobby mechanism and semi-automatic motions, as well as the introduction of multicolor mechanisms. A study is included regarding the preparation of materials and equipment prior to weaving.

TE 204, 205—*Fabric Design and Structure*—(2-2-3). The purpose of this course is twofold: to instruct the student on the technology of weave formation, and simultaneously, to instruct the student on analyzing and reproducing fabrics. In the technology of weave formation, the student studies the basic weaves and their derivatives. Such weaves as the twill, sateen and cord are among those considered. The student is also taught the methods employed in determining the structure of the simplier fabrics and how these fabrics may be reproduced. These methods include determining over-all and ground construction, yarn counts, fabric weight, drawing-in drafts, chain drafts, reed plan and color arrangement.

TE 206—*Yarn Technology*—(1-1). A course in the theory of the various procedures employed in the processing of raw materials into yarns. The natural and manufactured types of fibers are included in the course content.

TE 207—*Fabric Technology*—(2-1). A course in the theory of material fabrication, covering principally the weaving process in its variations and capabilities as related to application of fabric design.

TE 208, 209—*Fabric Design and Structure*—(4-3). A course similar to TE 204, 205 and tailored to the needs of students taking the Textile Design and Fashion curriculum. Students are concerned only with the developing of the more common weaves as well as with the analyzing and reproduction of the simplier fabrics. The designing of jacquard materials is given special emphasis.

TE 210—*Fabric Testing*—(2-1). A laboratory course in testing and analysis of fabrics working from fabric sample swatches. Elementary yarn testing and fiber identification is included. This course offers limited technical knowledge of physical characteristics of fabrics to the students majoring in design and fashion.

TE 300-301—*Yarn Technology*—(2-2-3). A continuation of TE 200, 201 on the mechanics, theories and applications involved with the roving and spinning equipment in the processing of sliver into spun yarn. Comparative studies are made of the various systems of drafting and its relation to sound economics. Cost factors with respect to the problems of mill organization and equipment are introduced in the latter portion of this study.
Prerequisite: TE 201.

TE 302, 303—*Fabric Technology*—(2-3-3). A comprehensive extension into study of more complicated mechanism related to various

types of weaving equipment. The design, related calculations, operation, timings and settings on the multiple mechanical devices are explored and studied.
Prerequisite: TE 203.

TE 304, 305—*Fabric Design and Structure*—(2-2-3). A continuation of the Fabric Design and Structure course given the previous year. The study of the technology of weaves includes double cloths, leno and jacquard constructions. Students are given more advanced fabrics to analyze for the determination of the data necessary in their reproduction as well as the methods employed in the development of fabrics with technical specifications.

TE 306—*Fabric Technology*—(2-0-2). A survey course relating to the characteristics, performance, properties and uses of various staple fabrics. Special emphasis is placed upon manner of development of textures in both natural and man-made fiber composed fabrics. The first part of the course consists of orientation in definition of terms and in the theory of fiber to yarn processing.

TE 309—*Materials and Fabrics*—(3-0-3). A survey course to fit the needs of the Business Administration student majoring in marketing. The classification of the natural and synthetic fibers is first discussed; this is then followed by the processes used in manufacturing the various yarns and fabrics. Continued study involves terminology as well as yarn and fabric characteristics.

TE 310—*Materials and Fabrics*—(3-0-3). A continuation of TE 310. The student familiarizes himself with the basic weaves and their effect on fabric construction and end use. Simple testing procedures for the identification of textile fibers, yarns and fabrics are also studied.

TE 400—*Yarn Technology*—(3-3-4). A continuation of TE 300, 301 on the mechanics, theories and applications involved with the use of combing and twisting equipment. In addition, laboratory problems are posed to the students in conjunction with their study of said machinery. Simultaneously, an analysis is made of man-made fibers and their methods of being processed.
Prerequisite: TE 301.

TE 401—*Yarn Technology*—(0-3-2). This course consists of projects as applied to one or more pieces of equipment. A term paper is prepared as a technical report in which a thorough discussion is made of the project. Library facilities are used to supplement and document this project.
Prerequisite: TE 400.

TE 402, 403—*Fabric Technology*—(1-3-2). Further extension of study of specific weaving mechanisms and processes, including reproduc-

tion of complicated and elaborate types of patterns such as Jacquard, leno, pile and looped textures.
Prerequisite: TE 303.

TE 404—*Knit Technology*—(2-1-2). A course of study in the fundamentals of the mechanisms and equipment relative to the manufacture of fabric by the process of knitting. The design, control, settings and mathematics pertaining to the various types of knit fabrication are explored and studied. The numerous processes of interlooping are basic elements of the course.

TE 405—*Knit Technology*—(2-1-2). An extension of TE 404 into the mechanical principles and the design of more intricate mechanisms related to the knitting process. Analysis and creation of fabric designs and patterns, basic and extensive, are an important part of the course.
Prerequisite: TE 404.

TE 406—*Physical Testing*—(2-3-3). A course designed to train the student in the techniques and instruments used for the determination of the fiber, yarn, and fabric properties studied. Special emphasis is placed on the theories underlying the determined properties as well as the interpretation of the data obtained.

TE 407—*Microscopy*—(2-3-3). A course designed to instruct the student in the use of an optical microscope; its value and limitations. The microscope is used in conjunction with fiber identification and structure; determination of blends, maturity, mercerization, and the physical, chemical and biological damage to textiles. The use of the various types of micrometers in the measure of length, diameter, area and other quantitative techniques. Recording of data by photomicrography.

TE 408—*Quality Control*—(3-0-3). A study of industrial quality control by statistical methods as applied to manufacturing processes. The methods of data analysis, inspection methods, determination of sample size and the construction and use of control charts.

TE 409—*Microscopy and Physical Testing*—(2-2-3). A course comprising the elements of TE 406 and TE 407 for Textile Chemistry majors.

NEW BEDFORD INSTITUTE OF TECHNOLOGY

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